Biological Report 90(9)
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Fish and Wildlife Service

U.S. Department of the Interior

Biological Report

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ISSN 0895-1926

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G. Ronnie Best, Debra S. Segal, and Charlotte Wolfe

U.S. Department of the Interior
Fish and Wildlife Service
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Preface

The National Ecology Research Center, U.S. Fish and Wildlife Service (FWS), is supporting a series of field research studies to document the relation between hydric soils and wetland vegetation in selected wetlands throughout the United States. This study is part of that series and continues an effort by Wentworth and Johnson (1986) to develop a procedure using vegetation to designate wetlands based on the indicator status of wetland vegetation as described by the FWS *National List of Plants that Occur in Wetlands* (Reed 1988). This list classifies vascular plants into one of five categories according to their frequency of occurrence in wetlands. In concurrence with the development of the wetland plant list, the Soil Conservation Service (SCS) developed a national list of hydric soils (Soil Conservation Service 1987). Studies supported by the National Ecology Research Center quantitatively compare associations of plant species, designated according to their hydric nature by the procedure of Wentworth and Johnson (1986), with the hydric nature of soils as designated on the Soil Conservation Service hydric soils list. The studies are being conducted across moisture gradients at a variety of wetland sites throughout the United States. Several studies have been modified to obtain concomitant information on groundwater hydrology.

These studies were conceived in 1984 and implemented in 1985 in response to internal planning of the FWS. They parallel, to some extent, ongoing efforts by the Soil Conservation Service to delineate wetlands for Section 1221 of the Food Security Act of 1985 (the swampbuster provision). The Soil Conservation Service and the FWS provided joint guidance and direction in the development of the Wentworth and Johnson (1986) procedure, and the SCS is presently testing a procedure that combines hydric soils and the Wentworth and Johnson procedure for practical wetland delineation. Efforts of both agencies are complementary and are being conducted in close cooperation.

The primary objectives of these studies are to (1) assemble a quantitative data base of wetland plant community dominance and codominance for determining the relation between wetland plants and hydric soils; (2) test various delineation algorithms based on the indicator status of plants against independent measures of hydric character, primarily hydric soils; and (3) test, in some instances, the correlation with groundwater hydrology. Results of these studies also can be used, with little or no supplementary hydrologic information, to compare wetland delineation methods of the U.S. Army Corps of Engineers (1987) and the Environmental Protection Agency (Sipple 1987).

Any questions or suggestions regarding these studies should be directed to: Charles Segelquist, 4512 McMurray Avenue, Fort Collins, CO 80525; FTS 323-5384 or commercial (303) 226-9384.

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ABSTRACT.—Vegetation on four hydric and two nonhydric soil series in north-central Florida was sampled as part of a national study examining the correspondence between wetland vegetation and soils. The wetland character of the vegetation was estimated by weighted average calculations using published wetland indicator values for individual plant species. The weighted averages produced an ordering of plant communities in general agreement with the hydric character of the soils. However, the two nonhydric soils had weighted average scores slightly below 3, normally considered the lowest end of the range of nonhydric vegetation. There was no clear or consistent effect of fire management on the weighted average scores. Vegetation strata (herbaceous, low shrub, tall shrub, and trees) were generally similar in weighted average values, with the wettest of the hydric soils tending to be low in all strata and the nonhydric soils tending to be high in all strata. However, strata differed considerably in the specific values for a single soil and in the specific rank ordering of soils in different strata.

Wetlands recently have been afforded increased protection through various changes in Federal regulations. These changes have resulted in significant part from an increased realization of the many unique values and functions of wetland ecosystems. Many of these values and functions are a direct result of wetlands being ecotonal systems between aquatic and terrestrial ecosystems, combining values unique to each of these two diverse landscape units yet creating an additional set of values unique to wetlands. Although many values and functions are ascribed to wetlands, some of the more significant relate to their function as wildlife habitat. Many wetlands serve as spawning, feeding, and breeding grounds for fish, shellfish, and waterfowl. Wetlands also provide unique habitat for many plants; and they perform many physical functions, such as flood abatement, stormwater retention, water quality enhancement, and stabilization of stream baseflow.

The U.S. Fish and Wildlife Service (FWS) is charged with classifying and mapping wetlands. To properly do so, wetlands must be clearly and concisely defined. The FWS defines wetlands as follows (Cowardin et al. 1979):

> Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. . . . wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. . . .
>
> The upland limit of wetland is designated as (1) the boundary between land with predominantly mesophytic and xerophytic cover; (2) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or (3) in the case of wetlands without vegetation or soil, the boundary between land that is flooded or saturated at some time [during the growing season] each year and land that is not.

To enhance the definition of wetlands and assist in delineating them, the FWS has been developing and refining a list of species indicative of wetlands (Reed 1988). In addition, the Soil Conservation Service is developing and refining a national list of hydric soils (Soil Conservation Service 1987). As wetland plants and soils lists are refined and tested, a more concise delineation of wetlands is attainable. However, the true value of the wetland species and hydric soils lists lies in their usefulness in defining those ecosystems ("lands") that provide the unique values and functions that have been attributed to wetlands.

The National Technical Committee for Hydric Soils (Soil Conservation Service 1987) set the following criteria for defining a hydric soil:

1. All Histosols except Folists,
2. Soils in Aquic suborders, Aquic subgroups, Salorthids great group, or Pell great groups of Vertisols that are
   a. somewhat poorly drained and have water table less than 0.5 foot from the surface for a significant time

(usually a week or more) during the growing season, or

b. poorly drained or very poorly drained and have
   (1) water table at less than 1.0 foot from the surface for a significant time (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 inches/h in all layers within 20 inches, or
   (2) water table at less than 1.5 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 inches/h in any layer within 20 inches, or
   (3) soils that are ponded for long duration or very long duration during the growing season, or
   (4) soils that are frequently flooded for long duration or very long duration during the growing season.

Unlike criteria used in indexing vegetation according to frequency of occurrence in wetlands, ranging from "obligate hydrophytes" to "upland" plants, soils criteria allow soils to be classified only as hydric or nonhydric.

The purpose of this study was to determine the relation between hydric and nonhydric soils and wetland vegetation: Do hydric soils support hydrophytic vegetation? Are hydrophytes (or "wetland" species) generally restricted to hydric soils? The Osceola National Forest, Florida, was the principal test area for this study. However, in later stages of the study, we included sites to examine the effect of disturbance on the soil–vegetation correlation. Accordingly, additional sites were studied in other areas in north-central Florida (specifically, Bradford Forest and Austin Cary Forest) without the principal form of "disturbance" (management by fire) common to the north-central Florida landscape.

Description of Study Sites

Osceola National Forest is in Colombia and Baker Counties in northern Florida, about 10 miles east of Lake City (Fig. 1). The forest contains more than 63,000 ha (157,000 acres) of somewhat poorly drained lands; cypress (*Taxodium* spp.), swamp blackgum (*Nyssa sylvatica* var. *biflora*), bay, and shrub–swamp communities are common. Most of the areas, however, are pine flatwoods, with a small percentage in upland forest. Pine flatwoods, like most of the other common communities, also occur on poorly or very poorly drained soils, and even the more xeric oak-dominated communities occur on somewhat poorly drained soils.

Austin Cary Forest and Bradford Forest, in north-central Florida (Fig. 1), are used by the University of Florida for research on forest dynamics and management. Plant communities, geology, physiognomy, and soils in these forests are similar to communities of Osceola National Forest. Austin Cary and Bradford forests provide sites comparable to the Osceola Forest, but without fire management during the last 50–60 years, specifically winter burning every 3–7 years.

Plant Communities

Pine–palmetto flatwoods constitute the major type of plant community in Osceola National Forest, covering more than two-thirds of the landscape. Four phases of flatwood communities are found in Osceola. They are pine–palmetto flatwoods, characterized primarily by slash pine (*Pinus elliottii*) and saw-palmetto (*Sereona repens*); loblolly pine (*P. taeda*) communities; loblolly–slash pine communities; and a small area of pond pine (*Pinus serotina*) communities. Pine flatwoods form a continuum from well-drained high pineland (uncommon) to the more common poorly drained flatwoods. Generally, loblolly pines, often with scattered oaks, are found on drier sites. Slash pines are found in flatwoods with moderately poorly drained to very poorly drained soils. Pond pines generally occupy fringes between poorly drained flatwoods and cypress or bay communities.

Cypress, blackgum, and bay communities are also common in Osceola National Forest, occupying almost one-third of the landscape. Cypress communities cover nearly a quarter of the forest. These communities may be dominated primarily by pond cypress (*Taxodium ascendens*), or with codominants such as swamp blackgum and slash pine. A small percentage of the cypress communities, especially around streams, is dominated by baldcypress, swamp blackgum, and ash (*Fraxinus* spp.). Bay communities account for about 12% of Osceola National Forest. Bay communities are generally codominated by sweet bay (*Magnolia virginiana*), red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), swamp blackgum, pond pine, and cypress. Some bay communities have few large trees and are dominated by low-growing shrubs—often referred to as shrub bogs or shrub swamps (U.S. Department of the Interior, Bureau of Land Management 1979).

High pinelands and oak/pine communities occupy less than 1% of Osceola (U.S. Department of the Interior, Bureau of Land Management 1979). These communities are generally dominated by scrub oaks (primarily turkey oak, *Quercus laevis*), water oak (*Q. nigra*), laurel oak (*Q. laurifolia*), loblolly pine, and slash pine.

Soils

Four hydric soils and two upland soils (Fig. 1) were sampled. The designated hydric soils were further subdivided into wet–hydric (Croatan and Surrency) and transitional–hydric (Mascotte and Sapelo) on the basis of relative moisture conditions. The upland soils were Ocilla and Albany. All soils were sampled in Osceola National Forest. Unmanaged (i.e., no periodic winter burning) representatives of the transitional–hydric soils were also sam-

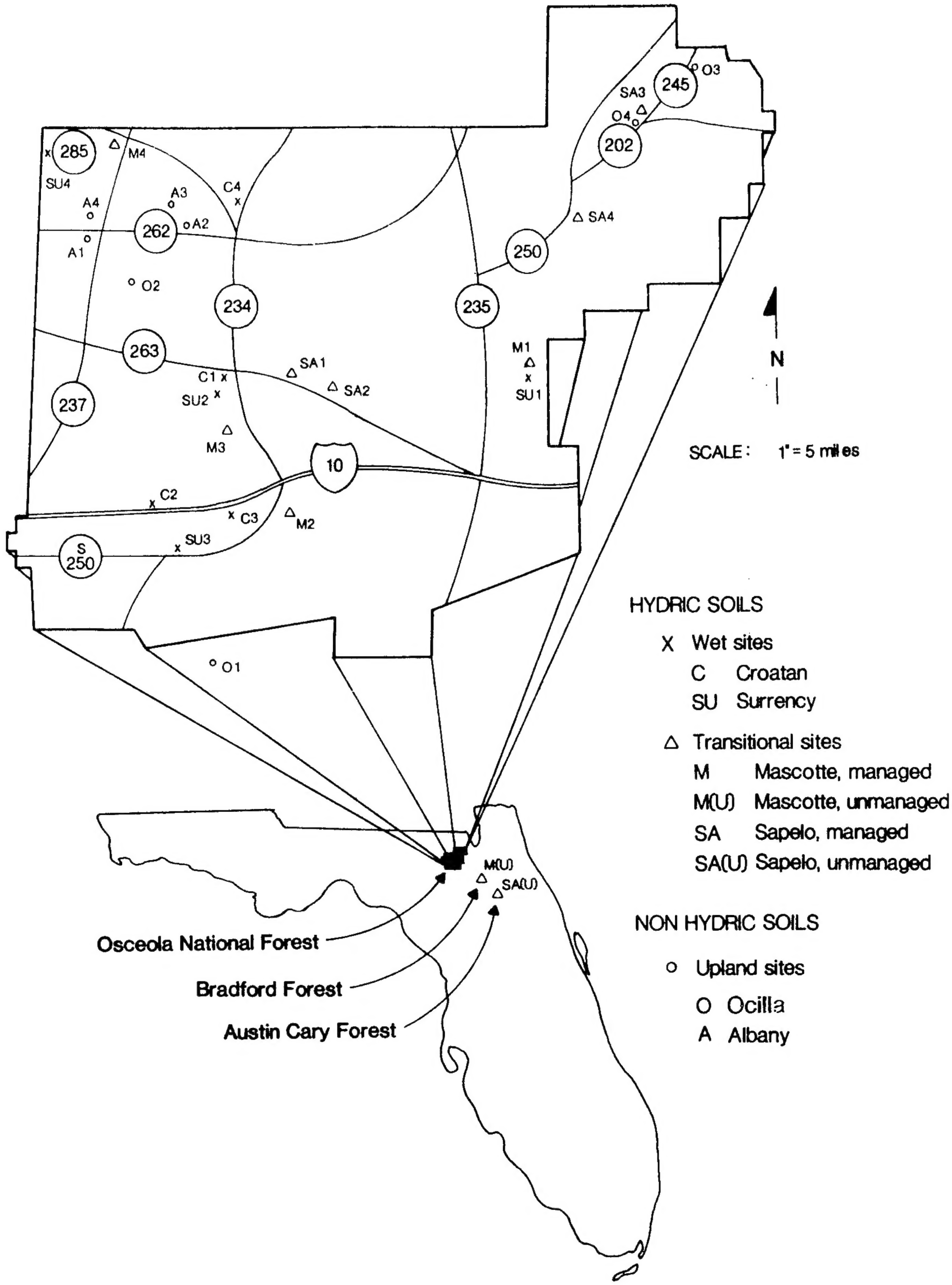

Fig. 1. Location of study sites.

pled in Austin Cary (Sapelo) and Bradford (Mascotte) forests.

Wet–Hydric Soils

The two wet–hydric series studied were Croatan and Surrency (Table 1). See Appendix A for more detailed general descriptions of these soils and Appendix B for brief pedon descriptions from the specific study sites. These very poorly drained soils formed in marine and fluvial sediments. They generally occur in depressions, low positions of the landscape, or along major tributaries. The water table is near or at the soil surface in winter and spring most years. During wet periods both soils are subject to flooding.

The Croatan soils (loamy, siliceous, dysic, thermic Terric Medisaprists) are in the Histosol soil order and, therefore, are hydric. Croatan soils remain wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of hydrophytic vegetation.

Surrency soils (loamy, siliceous, thermic family of Arenic Umbric Paleaquults) occur in the same general landscape as Croatan soil, but lack the thick organic muck horizons characteristic of Croatan soils. Surrency soils are ponded or flooded for long durations during the growing season (Soil Conservation Service 1984) and are members of the Aquic suborder. Therefore, they meet the criteria for hydric soils.

Transitional–Hydric Soils

Mascotte and Sapelo (sandy, siliceous thermic family of Ultic Haplaquods), the two transitional–hydric soil series studied (Table 1), are members of the Aquic suborder. Both series are poorly drained (Soil Conservation Service 1984) and possess a humus-rich (spodic) horizon within a meter of the surface. Spodic horizons, which can impede water infiltration, develop in humid environments from leaching of organic matter and aluminum with or without iron. These materials precipitate in a sandy horizon proximal to the subsurface zone in the soil where the water table fluctuates (Soil Conservation Service 1975).

Table 1. *Summary of soils studied.*

Soil series	Soil classification	Drainage	Hydric or nonhydric	Characteristics
Croatan	loamy, siliceous, dysic, thermic Terric Medisaprists	very poorly drained	hydric (wet)	organic surface and subsurface (42–127 cm) with underlying gleyed sandy loam and sandy clay loam horizons
Surrency	loamy, siliceous thermic Arenic Umbric Paleaquults	very poorly drained	hydric (wet)	black mucky sand (0–38 cm) with underlying gleyed sandy loam and sandy clay loam horizons
Mascotte	sandy, siliceous, thermic Ultic Haplaquods	poorly drained	hydric (transitional)	sandy surface horizons, spodic horizon 40–60 cm below soil surface, argillic horizon <102 cm below soil surface
Sapelo	sandy, siliceous, thermic Ultic Haplaquods	poorly drained	hydric (transitional)	sandy surface horizons, spodic horizon 40–60 cm below ground surface, gleyed sandy loam to clay loam argillic horizons >1 m below soil surface
Ocilla	loamy, siliceous, thermic Aquic Arenic Paleudults	somewhat poorly drained	nonhydric	sandy surface horizons 50 cm to 1 m thick, gray mottles within 75 cm of soil surface, argillic horizon <1 m below soil surface
Albany	loamy, siliceous, thermic Grossarenic Paleudults	somewhat poorly drained	nonhydric	sandy surface horizons 1–2 m thick, evidence of seasonal high water table, argillic horizon >1 m below soil surface

During rainy periods, the water table is generally less than 40 cm below ground surface. In drier months, the water table usually occurs deeper than 76 cm below ground surface (Soil Conservation Service 1984). Low position of these soils in the landscape coupled with fluctuating high water table contribute to the "hydric" properties of these soils.

Nonhydric Soils

The two nonhydric soil series studied (Table 1) were Ocilla (loamy, siliceous, thermic family of Aquic Arenic Paleudults) and Albany (loamy, siliceous, thermic family of Grossarenic Paleudults). Both series are somewhat poorly drained soils that formed in deposits of sandy and loamy sediments (Soil Conservation Service 1984).

In Osceola National Forest, the water table for Ocilla and Albany series occurs about 30 to 76 cm below the surface during a few wet months of the year. For the remaining months, the water table is usually deeper than 76 cm below the soil surface. These soils do not meet the hydric soil criteria.

Methods

Site Selection and Soil Sampling

Representative soils with the specified wet–hydric, transitional–hydric, and nonhydric conditions were identified and located on soil maps of the study areas (Soil Conservation Service 1984). Preliminary surveys confirmed the soil series and described the degree of disturbance (e.g., fire, logging, drainage). Criteria established for selection of study sites included lack of disturbance, soil characteristics near the central concept for each respective series, and an area large enough to adequately characterize the vegetation. Each of the six soil series was replicated four times, giving 24 study sites in Osceola National Forest, the primary study area. To assess the role of disturbance, eight additional study sites in "undisturbed" areas in Bradford and Austin Cary forests were added to the study. Soils were sampled by using soil cores (8-cm bucket augers) to confirm that study sites were in areas with the specified soil series. Kevin J. Sullivan (U.S. Department of Agriculture, Soil Conservation Service) confirmed soil identifications for sites in Osceola National Forest. Vergil Rogers, (U.S. Department of Agriculture, Soil Conservation Service, Savannah River Site, Aiken, South Carolina) confirmed soil identifications for study sites in Bradford Forest and Austin Cary Forest.

Vegetation Sampling and Data Analysis

Vegetation sampling was divided into four strata: trees, tall shrubs, short shrubs, and ground cover (Table 2). At each of four different study sites for each soil series, five randomly located plots were sampled. At each area, trees in a 100-m^2 quadrat were identified and dbh measured. Density of each shrub species in a 4-m^2 nested quadrat was determined by counting the number of stems for both tall and short shrubs. Percent cover of ground vegetation was estimated in two 0.5-m^2 nested quadrats or subplots in sites in Osceola National Forest, and in a single 1-m^2 nested quadrat in sites in Austin Cary and Bradford forests. Tabulations of the plant data are given in Appendixes C and D.

Data analysis follows procedures used by Scott et al. (1989) on a similar set of soil–plant data. A weighted

Table 2. *Sampling schemes for vegetation strata.*

Strata and definition	Variables measured	Size of quadrats (m^2)	Replications per soil series
Trees: all stems ≥7.5 cm dbh	Density: dbh (cm) all stems	100	5
Tall shrubs: woody species <7.5 cm dbh, ≥1.3 m tall	Density: count all main leaders	4	5
Short shrubs: woody species <1.3 m tall, ≥0.5 m tall	Density: count all individual plants emerging from ground	4	5
Ground cover: woody species <0.5 m tall and all herbaceous species regardless of height	Percent cover in 1–6 Daubenmire (1968) classes[a]	0.5	10

[a]Cover classes used for ground cover:

Cover class	Class range (%)	Midpoint value (%)
1	0–5	2
2	5–25	15
3	25–50	38
4	50–75	63
5	75–95	85
6	95–100	98

average index, similar to that used by Wentworth and Johnson (1986) and Wentworth et al. (1988), was calculated for each stratum at a plot as follows:

$$WA_j = \left(\sum_{i=1}^{n} W_{ij} S_i \right) / \left(\sum_{i=1}^{n} W_{ij} \right)$$

where

WA_j = weighted average for stratum j,
W_{ij} = weight or importance value for species i in stratum j,
S_i = ecological index for species i,
n = number of species in stratum j.

Where the herbaceous stratum was sampled by two 0.5-m^2 quadrats, the data were pooled to be as comparable as possible to the plots where the herbaceous stratum was sampled by a single 1.0-m^2 quadrat. An overall "community" weighted average index was calculated for each plot by averaging the weighted average values for all strata that occurred at the plot. Ecological index values (Tables 2 and 3) were derived from Reed (1988). Basal area was used as the measure of importance for the tree stratum, density was used for the tall and short shrub strata, and percent cover was used for the herbaceous stratum.

The Lilliefors and Bartlett tests indicated that *WA* scores were not generally normally distributed with homogeneous variances. Thus we used the Kruskal-Wallis nonparametric one-way analysis of variance to assess the significance of differences among soil types. Grouped, notched box plots of each soil and stratum were used to depict the distributions of *WA* values (McGill et al. 1978; Velleman and Hoaglin 1981; Scott et al. 1989). These plots display the distribution of data by quartiles, with the narrow sides of the box marking the first and third quartiles (Fig. 2). The length of the box is the interquartile range (*IQR*). The median is marked by a vertical line near the middle of the box. Horizontal lines extend to the extreme data values or to a point 1.5 times the *IQR* above and below the sides of the box. Remaining outliers are indicated individually. An approximate 95% confidence interval about the median is shown by the notch that spans the median by the amount $1.58(IQR)/n^{0.5}$ above and below the median, where *IQR* is the interquartile range and n is the sample size.

Results and Discussion

Differences in the weighted average index values among soils were significant ($P < .001$) for all strata and for the combined community index. A value of 3 may be considered the breakpoint between hydric and nonhydric vegetation. However, Wentworth et al. (1988) considered mean values of 2.5 to 3.5 to indicate intermediate vegetation, and Scott et al. defined intermediate vegetation based on 3 being within the 95% confidence interval around the median. Median values of the community index (Fig. 3) were below 3 for all soils, including the nonhydric Ocilla (2.67) and Albany (2.96). The upland Albany had a 95% confidence interval overlapping 3 and thus would be classified as intermediate according to the criteria of Scott et al. (1989).

There was generally good correspondence between the relative values of the community index and the relative hydric character of the soils (Fig. 3). The wet–hydric Croatan (1.61) and Surrency (1.76) soils had the lowest median community index values. The transitional–hydric

Table 3. *Categories of wetland indicator status.*

Indicator category	Ecological Symbol	Ecological Index	Definition
Obligate hydrophyte	OBL	1	A plant species that is generally (>99% of the time) found only in wetlands under natural conditions, but which may persist in areas converted to uplands (nonwetlands) or exist on upland sites if planted there.
Facultative wetland	FACW	2	A plant species that is usually (67–99% of the time) found in wetlands, but which may occasionally be found in uplands under natural conditions.
Facultative	FAC	3	A plant species that usually (34–66% of the time) occurs in wetlands, but which may commonly be found in uplands.
Facultative upland	FACU	4	A plant species that usually occurs in uplands, but which may rarely (1–33% of the time) be found in wetlands.
Upland	UPL	5	A plant species that almost never (<1% of the time) occurs in wetlands.

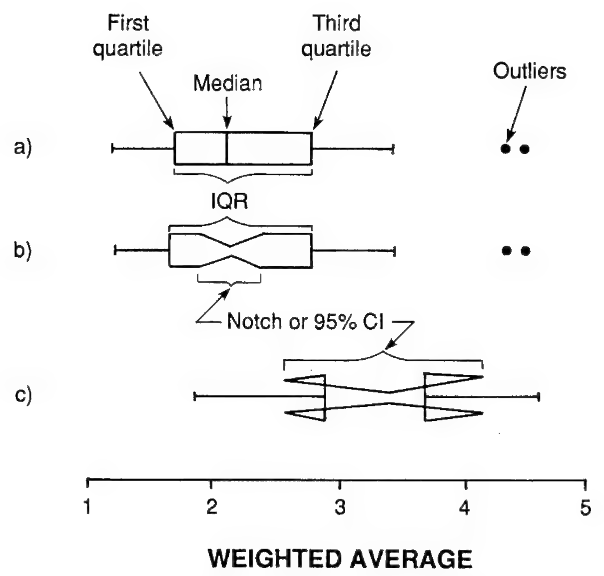

Fig. 2. Example box plots (from Scott et al. 1989). Data range and quartiles are measured on a weighted average index scale of 1 to 5. Box plot c) shows a data distribution where the notch depicting the 95% confidence interval (C.I.) exceeds the interquartile range.

soils in both managed and unmanaged areas had median values of the community index of 2.37 for unmanaged Mascotte to 2.84 for unmanaged Sapelo. The upland Albany (2.96) had the highest median community index value and the upland Oscilla was higher than all but two of the hydric soils.

There was some similarity in the weighted average scores among strata (Figs. 4–7). The wet–hydric Croatan and Surrency had low scores for all strata and the upland Ocilla and Albany had high scores, though not always the highest for all strata. However, there was substantial variation among strata in the median weighted averages for individual soils and in the rank order of soils.

Wet–Hydric Soils

In Osceola National Forest, the Croatan series is characterized by a thick, black organic muck surface, and subsurface horizons that are about 42 cm to slightly more than 1 m thick. A gleyed loamy argillic horizon occurs below the organic horizon. Croatan soils remain saturated for 8 months or more in most years, producing anaerobic conditions and thereby influencing the growth of vegetation. The low position of the Croatan series in the landscape in Osceola National Forest results in occasional ponding and a water table close to the soil surface most of the time; these contribute to the soil being very poorly drained.

Surrency soils occur in the same general landscape as Croatan soils, but lack the thick organic muck horizons characteristic of Croatan soils. The lower content of organic matter in Surrency soils may be attributed to increased water flow or scouring, which results in less organic matter accumulation or deposition during formation of these soils. Surrency soils in Osceola National Forest possess an umbric epipedon (dark surface horizon with a low base saturation) that is 20 to 40 cm thick. The dark coloration is the result of humus-sized organic particles coating the sand grains. Below the surface horizon is a highly leached sandy horizon that is 25 to 60 cm thick. From about 75 cm to more than 150 cm deep is a loamy, strongly gleyed argillic horizon.

Plant communities generally found on Croatan and Surrency soils are typified by cypress, swamp blackgum, and

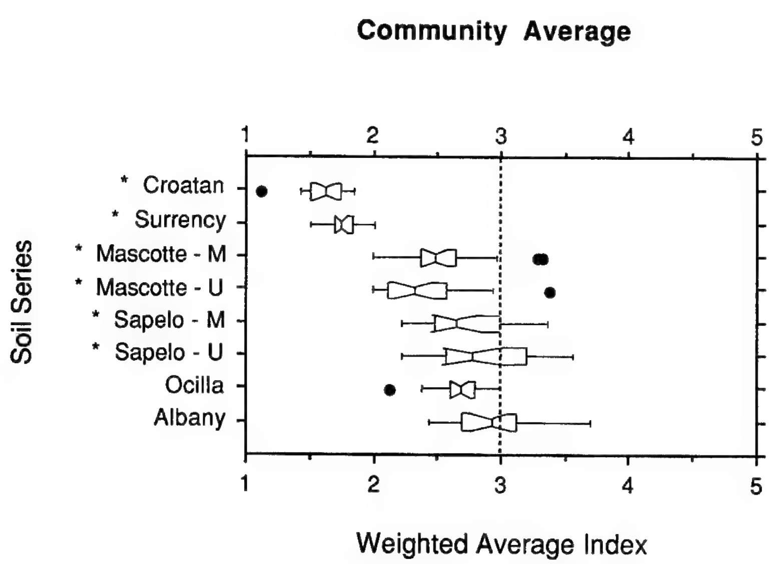

Fig. 3. Box plots showing distribution of weighted average plot scores for community composite of strata. * indicates hydric soils, *M* indicates managed sites, and *U* indicates unmanaged sites.

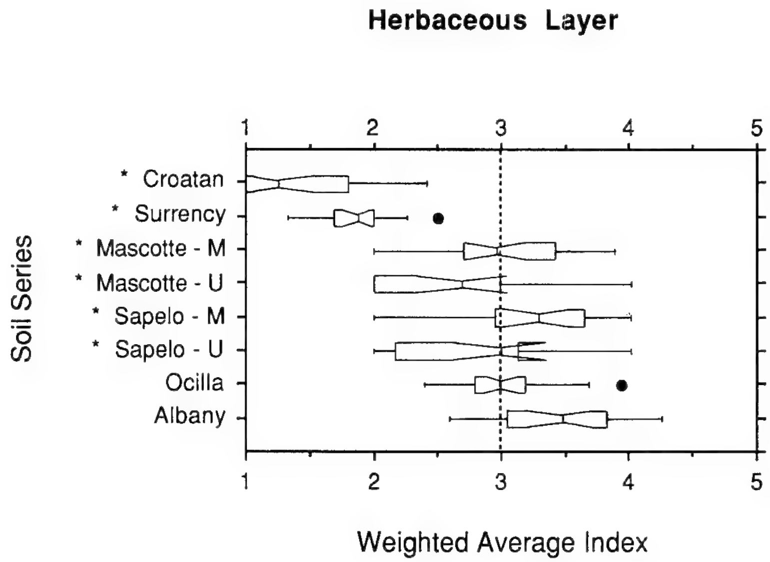

Fig. 4. Box plots showing distribution of weighted average plot scores for herbaceous stratum. * indicates hydric soils, *M* indicates managed sites, and *U* indicates unmanaged sites.

bays (Appendix C). These swamp communities are dominated by overstory vegetation such as swamp blackgum, cypress, slash pine, sweet bay, and red bay. *Lyonia lucida*, *Leucothoe racemosa*, *Clethra alnifolia*, and *Itea virginica* are the dominant shrubs. Dominant ground cover vegetation includes *Sphagnum* spp., *Lyonia lucida*, *Nyssa sylvatica* var. *biflora* (seedlings), *Utricularia* sp., and *Lemna* spp. (Appendix D).

The median weighted wetland index values for communities found on these wet–hydric soils were as low as 1.20 for the tree stratum of Croatan to as high as 2.06 for the tall shrub stratum of Surrency (Figs. 3–7). Swamp blackgum and cypress, each with an index value of 1, dominate the weighted wetland index value for these communities.

Transitional–Hydric Soils

Managed Sites in Osceola National Forest

Mascotte and Sapelo, the two transitional–hydric soil series studied, are similar in Osceola National Forest. As confirmed by soil cores (Appendix B), both have a spodic horizon 40–60 cm below ground surface underlain by a loamy gleyed argillic horizon (Appendix B). Depth to the argillic horizon is the factor that separates the two soils; it is about a meter (40 inches) for Mascotte soils and greater than a meter for Sapelo soils. Dominant tree species found on the representative transitional–hydric soils (Mascotte and Sapelo series) include slash pine and loblolly pine (Appendix C). *Ilex glabra*, *Serenoa repens*, and several species of *Vaccinium* and *Gaylussacia* dominate the shrub layer. *Ilex glabra*, *Aristida stricta*, *Serenoa repens*, and

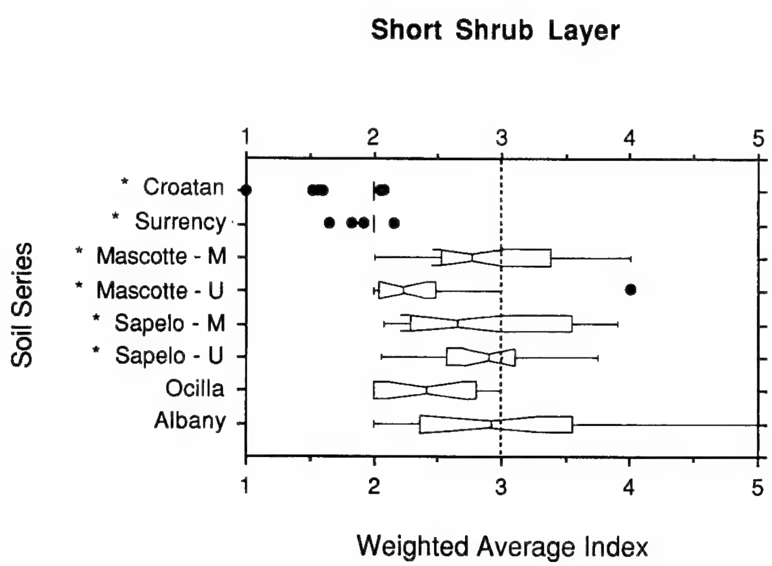

Fig. 5. Box plots showing distribution of weighted average plot scores for short shrub stratum. * indicates hydric soils, *M* indicates managed sites, and *U* indicates unmanaged sites.

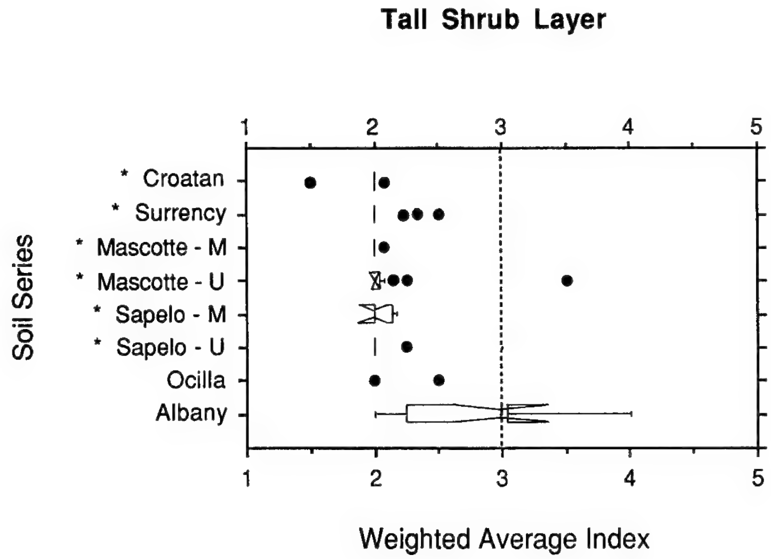

Fig. 6. Box plots showing distribution of weighted average plot scores for tall shrub stratum. * indicates hydric soils, *M* indicates managed sites, and *U* indicates unmanaged sites.

Vaccinium and *Gaylussacia* species are the most common ground cover vegetation (Appendix D).

On managed Mascotte, median weighted average index values ranged from 2.00 for the tree stratum to 2.99 for the herbaceous stratum, with a composite value of 2.54 (Figs. 3–7). On managed Sapelo, index values ranged from 2.06 for the tall shrub stratum to 3.24 for the herbaceous stratum, with a composite value of 2.71.

Unmanaged Sites in Austin Cary and Bradford Forests

Fire management and, in many areas, site preparation with active tree seed or seedling plantings are the primary management activities of pine plantations for forest resource production in this part of the southeastern United States. Although study sites in Osceola National Forest were selected in areas removed from intensive site preparation and active tree planting, the sites were subjected to regular (every 3–7 years) controlled burnings in winter or early spring. Therefore, to address the problem of fire management altering soil–vegetation correlations, the same soil series used for transitional–hydric soils in Osceola National Forest were sampled in Austin Cary and Bradford forests. Areas in these two forests are known to have been removed from fire for more than 60 years.

Mascotte soils in Bradford Forest and Sapelo soils in Austin Cary Forest are similar to the respective soils in Osceola National Forest. Both soils have spodic horizons 40–60 cm below the soil surface. On the unmanaged Mascotte, median weighted average index values ranged from 2.13 for the tall shrub stratum (Fig. 6) to 2.69 for the herbaceous stratum (Fig. 4), with a community average of 2.37 (Fig. 3). On the unmanaged Sapelo, index values

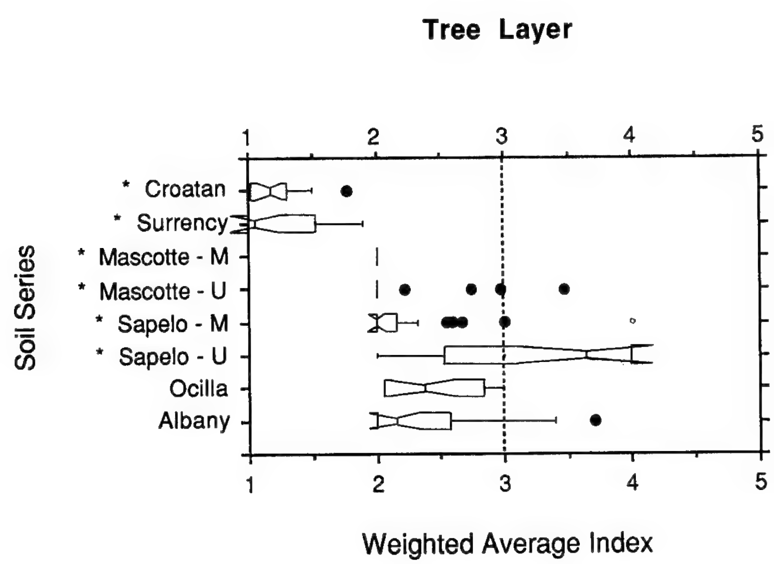

Fig. 7. Box plots showing distribution of weighted average plot scores for tree stratum. * indicates hydric soils, *M* indicates managed sites, and *U* indicates unmanaged sites.

ranged from 2.02 for the tall shrub stratum to 3.31 for the tree stratum, with a composite community value of 2.84. The 95% confidence interval for both of these soils was below 3, although unmanaged Sapelo was close to 3. For Mascotte, the managed sites had a slightly higher composite index (2.54) than the unmanaged sites (2.37), whereas for Sapelo the managed sites (2.71) were slightly lower than the unmanaged (2.84).

Nonhydric Soils

Ocilla and Albany soils have sandy surface horizons overlying a loamy textured argillic horizon. Depth to argillic horizon is the principal factor separating the two series. The argillic horizon occurs at less than 1 m in Ocilla soils and greater than 1 m in Albany soils (Appendix A).

Dominant tree species on Ocilla and Albany soils are slash pine, laurel oak, red bay (*Persea borbonia*), water oak, and live oak (*Quercus virginiana;* Appendix C). Dominant shrubs include *Ilex glabra, Quercus nigra, Quercus laurifolia, Myrica cerifera, Liquidambar styraciflua, Smilax bona-nox, Asimina angustifolia,* and species of *Vaccinium* and *Gaylussacia. Gelsemium sempervirens,* several species of *Vaccinium* and *Gaylussacia, Panicum* sp., and *Ilex glabra* are the dominants among the ground cover vegetation (Appendix D). Median weighted wetland index values for vegetation on nonhydric Ocilla and Albany soils ranged from 2.40 for the Albany tree stratum to 3.44 for the Albany herbaceous stratum (Figs. 4–7). Composite community index values (Fig. 3) were below 3 for both these nonhydric soils (2.67 for Ocilla and 2.96 for Albany); however, the 95% confidence interval for Albany overlapped 3, producing an intermediate classification for this soil according to the criteria of Scott et al. (1989).

Role of Management

The most significant influence of management on soil–plant correlation in the study areas relates to the extensive use of slash pine (standard index value of 2) in silvicultural practices displacing loblolly pine and longleaf pine (each with standard index values of 3) from the landscape.

One would expect fire management of pine flatwood forests to significantly reduce the presence of wetland indicator plants; however, that general pattern was not observed (Figs. 3–7). We believe this is because the pattern of tolerance to fire by many species found in flatwoods and wetlands is probably related to historical patterns of fires that typified these communities in Florida. Fires were historically typical of wetlands, influencing wetland succession (Monk 1965, 1966; Monk and Brown 1965). Frequent fires also typified the flatwood landscape (Laessle 1949; Edmisten 1963). Therefore, many species found in flatwoods and adjacent swamps are tolerant to fires.

Modification of Wetland Plant Index

In general, the wet season for north-central and peninsular Florida starts in summer (May–June) and extends until after the tropical storm season ends in October. This pattern leads to flooded or saturated soil during much of the growing season. For this reason, some species typically found in wetland habitats flooded during the dormant season in other regions of the United States, and even elsewhere in the southeastern United States, may be intolerant of the pattern of growing-season flooding typical of Florida. In addition, regional ecotypes of some plants may have increased tolerance to flooding under Florida's climatic pattern. Therefore, the standard wetland plant index (Reed 1988) may need to be modified for conditions specific to north-central Florida.

Although slash pine may have occupied the mesic–hydric ecotone in the native flatwood landscape in the past (Laessle 1942; Edmisten 1963), slash pine use as a primary forest plantation species has altered its role in the landscape. Now, slash pine is found not only in the pine flatwood and associated ecosystems but throughout the north-central Florida landscape. Slash pine is often seeded or directly planted even in marginal (wet) lands. Even if not directly planted, the ubiquitous presence of slash pine seeds can contribute significantly to the presence of slash pine outside of its typical range. Although under historical settings a wetlands index value of 2 would have been appropriate, the ubiquitous use of slash pine in the landscape precludes its usefulness in defining "wetland" conditions. Therefore, a wetland index value for slash pine of facultative (3) may be more appropriate. This change to a neutral assignment would reflect intense silvicultural practices resulting in occurrence of *Pinus elliottii* in all communities in the Osceola National Forest, as well as throughout Florida.

Ilex glabra is also generally found in mesic flatwoods, often in association with saw-palmetto (*Serenoa repens;* index value of 4). *Ilex glabra* might be more appropriately moved from facultative wet (2) to facultative (3). This change would more correctly represent the distributional range of *Ilex glabra,* especially in pine flatwood communities.

Conclusions

Weighted average index calculations based on the plant list of Reed (1988) produced an ordering of plant communities in general agreement with the hydric character of the soils. The wet–hydric soils had composite community index values of 1.61 to 1.76, the transitional–hydric soils had community values of 2.37 to 2.84, and the nonhydric soils had values of 2.67 to 2.96.

All soils sampled had median community index values below 3, the normal breakpoint separating hydric from nonhydric plant communities. However, with the exception of unmanaged Mascotte (2.37), all the transitional–hydric and nonhydric soils had community index values between 2.5 and 3. The nonhydric Albany (2.96) had a 95% confidence interval about the median that overlapped 3, classifying this soil as intermediate by the criteria of Scott et al. (1989).

There was no clear or consistent effect of fire management on the weighted average values. Sites with periodic winter burning had a slightly higher community index value on Mascotte soil and a slightly lower value on Sapelo soil.

The strata were generally similar in median weighted average values; the wet–hydric soils tended to be lowest in all strata and the nonhydric soils tended to be high. However, there were considerable differences among strata in both the values for one soil and the rank ordering of soils.

We suggest several modifications to the index values for specific species such as slash pine to more accurately reflect the frequency of occurrence in wetlands in northcentral Florida.

Acknowledgments

Several people provided much needed assistance on this project. D. W. Hall and W. Judd, University of Florida, assisted in identifying and confirming identification of plant species. K. J. Sullivan, Soil Scientist with the U.S. Department of Agriculture, Soil Conservation Service, assisted in confirming soil identifications for Osceola National Forest, Florida, study sites. V. Rogers, Soil Scientist for the Soil Conservation Service with the Savannah River Site, Aiken, South Carolina, confirmed soil identifications for study sites in Bradford Forest and Austin Cary Forest. L. Crowder, with assistance by C. Cox, diligently and patiently prepared the tables and appendixes.

We thank W. M. Kitchens, Unit Leader, Florida Fish and Wildlife Cooperative Research Unit, University of Florida, for his assistance in securing and administering funding for the study. The Savannah River Ecology Laboratory, University of Georgia, provided release time and travel support for D. Segal, C. Wolfe, and V. Rogers to return to Gainesville in 1988 to conduct sampling of eight additional "undisturbed" sites. R. Sharitz approved the assistance of SREL. Special thanks goes to G. T. Auble, Project Officer, National Ecology Research Center, Fort Collins, Colorado, for his guidance and invaluable input into various aspects of sampling, data analysis, and report preparation. Several reviewers offered excellent suggestions for improving the report. This report was prepared under Contract Number 14-16-0009-1544.

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Appendix A. Description of Soil Series

Albany Series

The nonhydric Albany series consists of somewhat poorly drained soils that formed in Coastal Plain deposits of sandy material underlain by loamy sediments. Slopes range from 0 to 5%.

Taxonomic Class Loamy, siliceous, thermic Grossarenic Paleudults.
Typical Pedon Albany sand—on a <1% slope in woodland. (Colors are for moist soil unless otherwise stated.)

Ap—0 to 7 inches; dark gray (10YR 4/1) sand; gray (10YR 5/1) dry; single grained; loose; few fine and medium roots; very strongly acid; abrupt smooth boundary. (6 to 10 inches thick)

E1—7 to 25 inches; light yellowish brown (2.5Y 6/4) sand; few fine faint mottles of light gray and a few fine distinct yellow mottles; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

E2—25 to 42 inches; brownish yellow (10YR 6/8) loamy sand; common medium faint yellow (2.5Y 7/6) and few fine distinct light gray mottles; single grained; loose; very strongly acid; gradual wavy boundary.

E3—42 to 48 inches; brownish yellow (10YR 6/6) loam sand; many medium distinct light gray (10YR 7/1) and few fine faint yellowish brown mottles; single grained; loose; very strongly acid; gradual wavy boundary. (combined thickness of the E horizon is 34 to 70 inches)

Bt1—48 to 56 inches; light yellowish brown (10YR 6/4) sandy loam; common medium faint pale brown (10YR 6/3), common medium distinct light gray (10YR 7/1), few medium distinct yellowish brown (10YR 5/6), and few fine distinct strong brown mottles; weak medium subangular blocky structure; very friable; few slightly hard lumps or concretions; sand grains coated and bridged; few lenses of light gray sand; very strongly acid; gradual smooth boundary. (4 to 10 inches thick)

Bt2—56 to 64 inches; mottled light yellowish brown (10YR 6/4), light gray (10YR 7/1), yellowish brown (10YR 5/8), pale yellow (2.5Y 7/4) sandy clay loam; moderate medium subangular blocky structure; friable; few slightly hard lumps or concretions; discontinuous clay films in some pores; sand grains coated and bridged; few fine lenses of light gray sand; very strongly acid; gradual wavy boundary. (6 to 12 inches thick)

Btg—64 to 70 inches; gray (N 6/0) sandy clay loam; many coarse distinct pale yellow (2.5Y 7/4) and yellow (10YR 7/6) and few fine prominent red mottles; moderate medium subangular blocky structure; friable; sand grains coated and bridged; few fine light gray lenses of sand; very strongly acid; clear wavy boundary. (4 to 12 inches thick)

B′t—70 to 88 inches; mottled gray (N 6/0), red (10YR 4/8), and yellow (2.5YR 7/6) sandy clay loam; red mottles decrease with depth; weak medium subangular blocky structure; very friable; common medium lenses of light gray (N 7/0) sand; very strongly acid.

Type Location Effingham County, Georgia; in a small plantation of pines 2.25 miles east of Georgia Highway 17 in Guyton, Georgia, along Georgia Highway 119; 200 feet south of highway.
Range in Characteristics Solum thickness ranges from 60 to 96 inches. Reaction ranges in the Ap or A horizon from extremely acid to slightly acid and in the E and B horizons from very strongly acid to medium acid.

The Ap or A horizon has hue of 10YR, 2.5Y, and neutral, value of 3 through 6, and chroma of 1 or 2. Texture is sand, fine sand, loamy sand, and loamy fine sand.

The E horizons have hue of 10YR or 2.5Y, value of 5 through 8, and chroma of 2 through 8; and hue, value, and chroma of 5Y 7/2. Mottles are in shades of white, gray, yellow, olive, brown, and red. Mottles of chroma 2 or less are within 30 inches of the surface. Texture is sand, fine sand, loamy sand, or loamy fine sand.

The BE horizon, when present, has hue of 10YR, value of 4 through 6, and chromas of 4 or 6, or hue of 2.5Y, value of 5 through 8, and chroma of 4 or 6. Mottles are in shades of gray, yellow, brown, and red. Texture is sandy loam, fine sandy loam, or loamy sand.

The Bt horizon has hue of 7.5YR, value of 5 through 7, and chroma of 6 or 8; hue of 10YR, or 2.5Y, value of 4 through 8, and chroma 3 through 8. Mottles are in shades of white, gray, yellow, brown, and red. In some pedons, the Bt horizons lack a matrix color, and are mottled red, yellow, brown, or gray. The lower Bt may be gleyed. Texture is sandy loam or sandy clay loam.

Competing Series These are Blanton, Darco, Eddings, Murad, Shankler, Tehran, and Troup series in the same family, and Bonneau, Chipley, Eustis, Lucy, Murad, Ocilla, Pactolus, Pocalla, Seabrook, and Wagram series. Blanton, Bonneau, Darco, Eddings, Lucy, Troup, and Wagram soils lack gray mottles in the upper 5 inches of the B horizon. Chipley, Pactolus, and Seabrook soils lack Bt horizons. Eustis soils have loamy sand or loamy fine sand Bt horizons. Lucy, Ocilla, and Wagram soils have sandy epipedons less than 40 inches thick. Murad soils have mixed mineralogy. Pocalla soils have epipedons less than 40 inches thick and have a bisequal profile.

Setting Albany soils occur in level and gently undulating landscapes with dominant slopes of 0 to 2% but ranging up to 5%. They formed in deposits of sandy and loamy sediments. They are seasonally wet. The climate is humid, temperate to subtropical. Rainfall averages 40 to 55 inches annually with mean annual temperatures of ≥65° F. Summers are hot; July temperatures average about 80° F. Winters are cool and moist with January temperatures averaging near 50° F.

Geographically Associated Soils These include the competing Blanton, Bonneau, Chipley, Pactolus, and Ocilla series and the Lakeland, Lynchburg, Pelham, and Plummer series. Lakeland soils lack argillic horizons within 80 inches of the surface and occupy higher areas. Lynchburg soils have argillic horizons within 20 inches of the surface, and Pelham and Plummer are poorly drained.

Drainage and Permeability Somewhat poorly drained. Seasonal high water table is within 12 to 30 inches of the surface for 1 to 4 months yearly. Permeability is rapid in the sandy horizons and moderate in argillic horizons. Runoff is slow. In some areas, flooding is possible under abnormal conditions.

Use and Vegetation Consists mostly of cut-over stands of longleaf, slash, or lobolly pine with intermixed oaks and other hardwood trees. In some localities, an understory of gallberry, wax myrtle, scattered saw-palmetto, and a fairly heavy stand of wiregrass are characteristic. A small acreage is used for pasture, vegetable crops, corn, and tobacco.

Distribution and Extent Chiefly Georgia, Florida, and perhaps North Carolina, South Carolina, and southeast Alabama. The series is moderate in extent.

Series Established Appling and Jeff Davis Counties, Georgia; 1969. Rev. RHA:RR:MES, October 1980.

Croatan Series

The hydric Croatan series consists of very poorly drained, organic soils that formed in highly decomposed organic material underlain by loamy textured marine and fluvial sediment. The organic material was derived from herbaceous plants. The soils are on the lower and middle Coastal Plain. Slopes are 0 to 2%.

Taxonomic Class Loamy, siliceous, dysic, thermic Terric Medisaprists.

Typical Pedon Croatan muck—woodland. (Colors are for moist soil unless otherwise stated.)

Oa1—0 to 9 inches; black (N 2/0) broken face and rubbed sapric material; about 8% fibers unrubbed and 2% rubbed; moderate fine granular structure; very friable; common fine and medium roots; common grains of clean sand; about 95% organic content; extremely acid; gradual wavy boundary. (5 to 15 inches thick)

Oa2—9 to 15 inches; black (N 2/0) broken face and rubbed sapric material; about 5% fibers unrubbed and 1% rubbed; weak medium granular structure; very friable; few fine and medium roots; few grains of clean sand; about 90% organic content; extremely acid; gradual wavy boundary. (5 to 20 inches thick)

Oa3—15 to 28 inches; black (10YR 2/1) broken face, (N 2/0) rubbed; sapric material; about 5% fibers unrubbed, <1% rubbed, massive; very friable; few fine roots; few grains of clean sand; about 75% organic content; extremely acid; diffuse wavy boundary. (6 to 20 inches thick)

2Ag—28 to 33 inches; black (5YR 2/1) mucky sandy loam; massive; very friable; few fine and medium roots; about 80% mineral content; extremely acid; gradual wavy boundary. (0 to 10 inches thick)

2Cg1—33 to 38 inches; dark brown (7.5YR 3/2) sandy loam; massive; very friable; few nearly decomposed medium roots; extremely acid; gradual wavy boundary. (4 to 12 inches thick)

2Cg2—38 to 60 inches; grayish brown (10YR 5/2) sandy clay loam; massive; slightly sticky, slightly plastic; few nearly decomposed medium roots; extremely acid; gradual smooth boundary. (10 to 30 inches thick)

2Cg3—60 to 80 inches; mottled grayish brown (10YR 5/2) and dark gray (10YR 4/1) loamy sand; massive; very friable; extremely acid.

Type Location Jones County, North Carolina; 6.1 miles southeast of Maysville in Croatan National Forest; 3.9 miles east of intersection of NC 58 and SR 1105; 3.3 miles northeast of intersection of SR 1105 and Mirey Branch Road; 0.9 miles north of intersection of Stewart Road and USFS 606A; 50 feet east of the culvert over canal in woods.

Range in Characteristics Thickness of the organic materials commonly is 16 to 35 inches but ranges to 51 inches. The organic materials are extremely acid. The underlying material horizons are extremely acid through slightly acid. Logs, stumps, and fragments of wood occupy 0 to 10% of the organic layers. Fiber content of the organic tiers is 3 to 30% unrubbed and <10% rubbed. Charcoal particles and pockets of ash occur in some pedons.

The Oa horizons have hue of 7.5YR, value of 2 or 3, and chroma of 0 to 2. After several years of drainage and cultivations, a granular or blocky structure develops in all or part of the organic layers depending upon the nature and depth of the organic material as well as duration of drainage. Consistency, when moist, ranges from very friable to friable and, when wet, from slightly sticky to sticky (non-colloidal). In undrained areas the organic horizons in the root zone have weak to moderate granular or blocky structure while below the root zone the organic material is generally massive.

The 2Ag horizon has hue of 5YR to 5Y, value of 2 to 7, and chroma of 1 to 3. Textures are mucky sandy loam, mucky fine sandy loam, sandy loam, loam, and fine sandy loam.

The 2Cg horizons are similar in color to 2Ag but range to hues of 5GY to 5G, value of 4 to 7, and chroma of 1. Textures are variable and range from sand to clay.

Competing Series There are no other known series in this family. Those in closely competing families are the Belhaven, Dare, Dorovan, Mattamuskeet, Pamlico, Ponzer, Pungo, and Scuppernong series. Belhaven, Dare, Dorovan, and Pungo soils have organic materials 51 inches or more in thickness. Mattamuskeet and Pamlico soils have sandy mineral horizons under the organic horizons.

Setting Croatan soils are on the lower and middle Coastal Plain at elevations above about 25 feet. Elevation near the type location is about 38 feet above mean sea level. Slopes range from 0 to 2%. The soils formed under very poorly drained conditions from the remains of herbaceous and related woody hydrophytic plants. The mean annual temperature is 65° F (18° C) and mean annual precipitation is 51 inches near the type location. The growing season is about 190 days.

Geographically Associated Soils In addition to the competing Dare, Dorovan, and Pamilco series, these are the Bayboro, Pantego, Rains, and Torhunta series. Bayboro, Pantego, Rains, and Torhunta are mineral soils, and except for Rains, they have umbric epipedons.

Drainage and Permeability Very poorly drained; runoff is very slow to ponded. Permeability is slow to moderately rapid. In drained areas, it is moderate in organic layers and moderate or moderately slow in mineral layers. Except where drained, Croatan soils are saturated for 8 to 10 months of the year.

Use and Vegetation Much of the acreage is wooded and supports plant communities that reflect past history of treatment. Native vegetation consists of scattered pond pine with a dense understory of titi, gallberry, huckleberry, southern bayberry, greenbrier, sphagnum moss, redbay, sweetbay, switchcane, and giant cane. Croatan soils also support mixed hardwoods, mainly water and swamp tupelo, southern baldcypress, Atlantic white-cedar, and other hyperphytic species. Cultivated areas are pastured or cropped to corn, soybeans, small grain, and vegetable crops.

Distribution and Extent Middle and Lower Coastal Plain of Alabama, North Carolina, South Carolina, Virginia, and possibly Florida and Mississippi. The series is moderately extensive.

Series Established Jones County, North Carolina; 1978. Rev. ENH, April 1984.

Remarks In some previous correlations these soils were correlated as Ponzer or were considered taxadjuncts to the Ponzer series.

Mascotte Series

The hydric Mascotte series consists of nearly level, poorly drained soils that formed in marine deposits of sandy and loamy sediment. These soils occur in broad flatwood areas and depressions of low stream terraces. Slopes are smooth and range from 0 to 2%.

Taxonomic Class Sandy, siliceous, thermic Ultic Haplaquods.
Typical Pedon Mascotte.

A—0 to 8 inches; black (10YR 2.5/1) fine sand; moderate medium granular structure; very friable, common roots; extremely acid (pH 4.0); clear smooth boundary.

E—8 to 17 inches; light gray (10YR 6/1) fine sand; single grain; friable to loose; few roots; strongly acid (pH 5.5) clear smooth boundary.

Bh—17 to 23 inches; black (10YR 2/1) fine sand; moderate medium granular structure; weakly cemented; firm; common roots; extremely acid (pH 4.0); clear smooth boundary.

E′g—23 to 30 inches; gray (10YR 6/1) fine sand; single grain; wet nonsticky; few roots; very strongly acid (pH 5.0); gradual smooth boundary.

Btg—30 to 60 inches; light gray (10YR 6/1) fine sandy clay loam with common medium distinct mottles of strong brown (7.5YR 5/6); weak fine subangular blocky structure; firm; few roots; very strongly acid (pH 5.0).

Type Location Osceola National Forest, Florida; Section 3T2S-R20E; Forest Service Code 40280.
Range in Characteristics Depth to the argillic horizon ranges from 30 to 40 inches. Thickness of Bh horizons ranges from 3 to 8 inches. Depth to the Bh horizon ranges from 16 to 24 inches.
Landform This soil is on flat ridges on old marine terraces and occurs throughout the forest. Slopes are generally <1% but range to 2%.
Water Table and Drainage The seasonal high water table is on the surface, but this is for short periods of a week or less during the wettest portions of the year. The water table is generally within one foot of the surface for 6 or more months per year (slightly wetter than official series). During the driest part of the year, in October and November, the water table will drop as low as 4 feet. The Btg horizon has moderate permeability. Internal drainage is reduced because of the depth to water table where this soil is in depressional positions of the landscape.
Inclusions About 20% of this unit is wetter than described and there are small ridges included where the soil is better drained.
Vegetation The plant community is pine–palmetto flatwoods with slash pine dominating but longleaf is common. Gallberry is the dominant understory plant and it is often >5 feet tall and vigorous. Saw-palmetto and wax myrtle are scattered and are variable in height. Ground vegetation consists of wiregrass, which is relatively abundant, blueberry, huckleberry, bluestem, and beak rush.
Use and Management The preferred tree species for timber management is slash pine. Longleaf will grow on this soil and was the original dominant tree species. Site preparation often needs to be moderate and bedding is needed on some sites, particularly near bays where the soil is wetter than average for the unit. The high water table limits the use of this soil and must be considered in the design of developments.

Ocilla Series

The nonhydric Ocilla series consists of somewhat poorly drained, moderately permeable soils formed in sandy and loamy marine sediments. These soils are on low uplands and stream terraces. Slopes range from 0 to 5%.

Taxonomic Class Loamy, siliceous, thermic Aquic Arenic Paleudults.
Typical Pedon Ocilla loam sand—on a nearly level slope in forest. (Colors are for moist soil.)

A—0 to 4 inches; very dark gray (10YR 3/1) loamy sand; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary. (3 to 10 inches thick)

E1—4 to 15 inches; light brownish gray (2.5Y 6/2) loamy sand; single grained; very friable; common fine and medium roots; common root holes filled with very dark gray loamy sand; common clean sand grains; strongly acid;

clear irregular boundary. (6 to 16 inches thick)

E2—15 to 28 inches; pale brown (10YR 6/3) loamy sand; many medium faint brownish yellow (10YR 6/6) mottles; weak medium granular structure; very friable; few fine roots; strongly acid; gradual wavy boundary. (10 to 18 inches thick)

BE—28 to 49 inches; brownish yellow (10YR 6/6) sandy loam; common medium distinct light gray (10YR 7/1) mottles; common medium pockets of sandy clay loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary. (0 to 24 inches thick)

Bt1—49 to 59 inches; brownish yellow (10YR 6/6) sandy clay loam with many large pockets of light gray (10YR 7/1) sandy loam; common medium distinct yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual irregular boundary. (4 to 16 inches thick)

Bt2—59 to 67 inches; mottled strong brown (7.5YR 5/6) and yellowish red (5YR 4/8) sandy clay loam containing common medium pockets of light gray (10YR 7/1) sandy loam; weak coarse angular blocky structure; friable; about 2% plinthite; very strongly acid.

Type Location Irwin County, Georgia; 2.6 miles east of Irwinville on Georgia Highway 32, and 2 miles north on county road in wooded area.

Range in Characteristics Solum thickness ranges from 68 to >80 inches. All horizons are strongly acid or very strongly acid, except those surface soils that have been limed.

The A horizon has hue of 10YR or neutral, value of 3 to 5, and chroma of 0 to 2. Where the A horizon has value <4, it is <7 inches thick. The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 4; hue of 2.5Y, value of 5 to 3, and chroma of 2 to 4; or hue of 5Y, value of 6, and chroma of 3. The E2 may have mottles in shades of brown, olive, or gray. Texture is sand, fine sand, loamy sand, or loamy fine sand.

The BE horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 3 to 8. Mottles are in shades of gray, yellow, brown, or red. The BE horizon is sandy loam. The Bt1 horizon has hue of 2.5Y, value of 6 or 7, and chroma of 4 or 6; hue of 10YR, value of 5 to 7, and chroma of 2 to 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles are in shades of gray, yellow, brown, or red. The Bt2 horizon is mottled in shades of gray, yellow, brown, and red. The matrix, where present, has hue of 2.5Y, value of 5, 6, or 7, and chroma of 1 to 6; hue of 10YR, value of 5, 6, 7, and chroma of 2 to 8; value of 6, and chroma of 1, 4, or 6, or value of 7, and chroma of 1; or neutral and value of 7. The Bt horizon is dominantly sandy clay loam and ranges from sandy loam to sandy clay. Pockets of sandy loam may occur in some subhorizons.

The C horizon, where present, has the same colors as the lower Bt horizon. It is sandy loam, sandy clay loam, sandy clay, or clay. The weighted average clay content of the upper 20 inches of the argillic horizon ranges from 15 to 35%. Plinthite ranges from none to about 3%.

Competing Series There are no competitors in the same family. Albany, Ardilla, Coosaw, Garcon, Leefield, and Lynchburg series are in similar families, somewhat poorly drained, nearly level, and low lying. Albany soils have a grossarenic epipedon. Ardilla soils have fragic properties in the BtX horizons. Coosaw soils have mixed mineralogy and a decreasing clay content in the lower part of the argillic horizon above 60 inches. Garcon soils have a solum <60 inches thick. Leefield soils have horizons which contain 5 to 20% plinthite ranging from 30 to 60 inches deep. Lynchburg soils lack an arenic epipedon and have matrix colors on chroma ≤2 throughout the Bt horizon.

Setting Ocilla soils are on level or nearly level landscapes; slopes are <2% but range to 5%. They have formed in deposits of sandy and loamy sediments largely of marine origin. Average annual precipitation is about 46 inches and average annual temperature is 67° F.

Geographically Associated Soils These included the competing Albany, Ardilla, and Leefield series and Alapaha, Bladen, Blanton, Clarendon, Cowarts, Dothan, Fuquay, Goldsboro, Grady, Herod, Kinston, Norfolk, Osier, Pelham, Plummer, Rains, Stilson, Tifton, and Wagram series. Alapaha, Bladen, Pelham, Plummer, and Rains soils are poorly drained, nearly level, and occur as low-lying broad flats or along drainageways and around the head of streams. Blanton, Clarendon, Goldsboro, and Stilson soils are moderately well drained on nearly level or very gently sloping upland or low ridges. Cowarts, Dothan, Fuquay, Norfolk, Tifton, and Wagram soils are well drained on the nearly level or gently sloping upland ridges and divides. Grady soils are poorly drained and in depressions. Herod, Kinston, and Osier soils are poorly drained alluvial soils on floodplains.

Drainage and Permeability Somewhat poorly drained; slow runoff; moderate permeability. Depth to the water table ranges from 12 to 30 inches for periods of 2 to 6 months.

Use and Vegetation Native vegetation is forest of slash and longleaf pine, scattered oaks, and a few blackgum, with an understory of wax myrtle, gallberry, scattered saw-palmetto, and wiregrass ground cover. These soils are used mostly for forestry, but some are cleared and planted to Bahia grass, coastal Bermuda grass, corn, tobacco, soybeans, rye, and vegetables.

Distribution and Extent Southern Georgia, southeastern Alabama, northern Florida, North Carolina, and South Carolina. The series is of moderate extent.

Series Established Rev. RHA:MES, October 1982.

Sapelo Series

The hydric Sapelo series consists of nearly level, poorly drained, acid soils that formed in thick deposits of loamy marine sediments. These soils occur in broad flatwood areas. Slopes are smooth to convex and range from 0 to 2%.

Taxonomic Class Sandy, siliceous, thermic Ultic Haplaquods.

Typical Pedon Sapelo fine sand.

A1—0 to 3 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; extremely acid; clear smooth boundary.

A2—3 to 6 inches; dark gray (10YR 4/1) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

E—6 to 23 inches; light brownish gray (10YR 6/2) fine sand; few fine faint light yellowish brown mottles; single grained; loose; slightly acid; clear wavy boundary.

Bh1—23 to 30 inches; mixed black (5YR 2/1) and dark reddish brown (5YR 2/2) fine sand; weak fine subangular blocky structure; friable; weakly cemented; sand grains well coated with organic matter; very strongly acid; gradual wavy boundary.

Bh2—30 to 32 inches; mixed black (5YR 2/1), dark reddish brown (5YR 3/2), and very dusky red (2.5YR 2/2) fine sand; weak fine subangular blocky structure; friable; weakly cemented; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

Bh3—32 to 38 inches; dark brown (10YR 4/3) fine sand; common coarse weakly cemented dark reddish brown (5YR 3/2) bodies; weak fine subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

Btg1—(first argillic horizon) 56 to 62 inches; gray (5Y 5/1) sandy clay loam; few fine distinct yellowish brown and brownish yellow mottles; weak fine subangular blocky structure; slightly sticky; strongly acid; gradual smooth boundary.

Btg2—62 to 80 inches; gray (5Y 5/1) fine sandy loam; common medium distinct dark brown (10YR 4/3) and many coarse prominent yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; slightly sticky; strongly acid.

Type Location Duval County, Florida; 40 feet east of Oliver Road, 350 feet north of Terrell Road, SW1/4SE1/4NE1/4 section 20, T 1 N, R26E.

Range in Characteristics Solum thickness ranges from 70 to 90 inches. Depth to the Bh is 10 to 30 inches and depth to the argillic is 40 to 70 inches. Silt plus clay in the 10- to 40-inch control section ranges from 5 to 15%.

The A horizon is black (N2/; 10YR 2/1), very dark gray (10YR 3/1; N3/), or dark gray (10YR 4/1; N4/). Texture is sand or fine sand.

The E horizon is light gray (10YR 7/1; 2.5YR 7/2), white (10YR 8/1; N8/), gray (10YR 5/1, 6/1; N5/, N6/), grayish brown (1YR 5/1), or light brownish gray (10YR 6/2). Texture is sand or fine sand.

The Bh horizon is black (5YR 2/1; 10YR 2/1), very dark brown (10YR 2/2), dark brown (10YR 3/3; 7.5YR 3/2, 4/2, 4/4), dark reddish brown (5YR 3/4, 3/3, 3/2, 2/2), very dusky red (2.5YR 2/2), or reddish brown (4YR 4/3, 4/4). It is sand or fine sand.

The Btg horizon is light gray (5YR 7/1, 7/2; 10YR 7/1, 7/2, 6/1), gray (5YR 5/1, 6/1), or white (10YR 8/1, 8/3; 5YR 8/1, 8/2). There are few to common yellow, red, and brown mottles. It is sandy loam, fine sandy loam, loam, clay loam, or sandy clay loam with pockets or lenses of sand and clay in the lower part of some pedons.

Competing Series These are the Olustee series in this family and the Leon, Lynn Haven, Mascotte, Murville, Pomona, Ridgeland, and Seagate series in similar families. Leon, Lynn Haven, Murville, and Ridgeland soils lack B′t horizons. Mascotte and Seagate soils have B′t horizons within 40 inches of the surface and Seagate soils have chroma 3 or higher dominant in the upper part of the B′t horizon. Olustee soils lack A2 horizons above the Bh and have B′t horizons within 40 inches of the surface. Pomona soils have soil temperature of more than 72° F, at depths of 20 inches below the soil surface.

Setting Sapelo soils are on nearly level flatwood areas in the lower Coastal Plain. Slopes are 0 to 2%. The soil formed in marine deposits of sandy and loamy sediments. Near the type location, the average annual precipitation is about 50 inches and the average annual temperature is about 67° F.

Geographically Associated Soils These are the competing Olustee series; the similar Leon, Mascotte, Murville, and Seagate series; and the Albany, Bladen, Chipley, Pelham, and Rutlege series. Albany, Bladen, Chipley, Pelham, and Rutlege soils lack spodic horizons.

Drainage and Permeability Poorly drained; slow runoff; and moderate permeability. Depth to the water table is 15 to 30 inches for 2 to 4 months in most years.

Use and Vegetation Most of this soil is wooded. Natural vegetation consists of longleaf pine, loblolly pine, pond pine, blackgum, and water oak. Understory plants are gallberry, saw-palmetto, and dwarf huckleberry.

Distribution and Extent Lower Coastal Plain of Georgia and possibly Florida, North Carolina, and South Carolina. The series is of moderate extent, with about 6,000 acres in Camden and Glynn Counties, Georgia.

Surrency Series

Soils of the hydric Surrency series are very poorly drained with black, sandy A horizons, grayish brown E horizons 20 to 40 inches thick, and mottled grayish brown loamy Btg horizons.

Taxonomic Class Loamy, siliceous, thermic Arenic Umbric Paleaquults.

Typical Pedon Surrency loam sand—ponded.

01—1 to 0 inch; spongy layer of moss.

A—0 to 12 inches; black (N 2/) loamy sand; weak fine and medium granular structure; very friable; many small and medium tree and shrub roots; small bodies of uncoated sand grains; extremely acid; clear wavy boundary. (10 to 16 inches thick)

E—12 to 32 inches; grayish brown (2.5Y 5/2) and dark grayish brown (10YR 4/2) sand; single grained; very friable; few fine and medium roots; most sand grains are clean; few sand grains coated with brown; extremely acid; gradual smooth boundary. (10 to 24 inches thick)

Btg1—32 to 48 inches; light gray (10YR 7/2) sandy loam with bodies of loamy sand; common medium distinct mottles of brownish yellow (10YR 6/6); weak medium subangular blocky structure; very friable; some sand grains coated with clay; few small roots; very strongly acid; gradual wavy boundary. (10 to 17 inches thick)

Btg2—48 to 65 inches; grayish brown (10YR 5/2) sandy clay loam; common medium and coarse distinct mottles of yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8); weak medium subangular blocky structure; patchy clay films on ped faces; very friable; very strongly acid.

Type Location Appling County, Georgia; 6.0 miles northwest of Surrency, Georgia, city limits on Old Baxley–Surrency road, then 0.25 mile north of road.

Range in Characteristics Solum thickness ranges from 60 to 100 inches.

The A horizon is black (10YR 2/1; N 2/ ; 5Y 2/1, 2/2) or very dark gray (10YR 3/1; N 3/ ; 5Y 3/1). The E horizon is light gray (10YR 7/1, 7/2; 2.5Y 7/2), grayish brown (10YR 5/2; 2.5Y 5/2), light brownish gray (10YR 6/2; 2.5Y 6/2), or dark grayish brown (10YR 4/2; 2.5Y 4/2). Mottles of chromas 5 through 8 range from common to none. The texture of the E horizon is loamy sand or sand. Thickness of the A and E horizons ranges from 20 to 40 inches. Reaction ranges from extremely acid to very strongly acid except where the soil has been limed.

The Btg horizon is light gray (10YR 7/1, 7/2; 5Y 7/1, 7/2), grayish brown (10YR 5/2; 2.5Y 5/2), gray (10YR 6/1, 5/1; 5Y 6/1, 5/1), or light brownish gray (10YR 6/2; 2.5Y 6/2). Mottles of brownish yellow (10YR 6/6, 6/8), brown (10YR 5/3), yellowish brown (10YR 5/4, 5/6, 5/8), and strong brown (7.5YR 5/6, 5/8) range from common to many. Texture of the Btg horizon is sandy loam or sandy clay loam. Clay content of the upper 20 inches ranges from 10 to 18%; it ranges from 23 to 35% below a depth of about 50 inches. Reaction ranges from strongly acid to very strongly acid.

Competing Series These are the Ellabelle, Hyde, Pantego, Paxville, Pelham, Pocomoke, Portsmouth, Torhunta, and Rutlege series. Hyde, Pantego, Paxville, Pocomoke, Portsmouth, and Torhunta soils have A horizons <20 inches thick. Also, Hyde and Portsmouth soils have mixed mineralogy. Pelham soils lack an umbric epipedon. Rutlege soils lack an argillic horizon. Ellabelle soils have >18% clay in the control section.

Setting Surrency soils occur along nearly level drainageways and in depressions of the Atlantic Coastal Plains. Slopes are <1%. The regolith is marine or fluvial deposits of loamy materials. The climate is warm and humid. The mean annual air temperature is 67° F near the type location. The average annual precipitation is about 49 inches.

Geographically Associated Soils These include the competing Paxville, Pelham, Pantego, Portsmouth, and Rutlege series, and the Bayboro, Byars, Johnston, Leefield, Leon, Lynn Haven, Mascotte, Osier, and Plummer series. Bayboro, Byars, and Paxville soils have A horizons <20 inches thick. Johnston and Osier soils lack argillic horizons. Leefield soils have chromas of >2 in the matrix of the argillic horizon and lack the umbric epipedon. Leon, Lynn Haven, and Mascotte soils have spodic horizons. Plummer soils have a sandy A horizon >40 inches thick.

Drainage and Permeability Very poorly drained. The water table is at the surface for long periods of the year, and ponding is common. The permeability is rapid in the A horizon and moderate in the B horizon.

Use and Vegetation A major part of the soil is in forest or water-tolerant grasses. Cleared areas that have been drained are used for pasture grasses. Common tree species are loblolly pine, slash pine, baldcypress, sweetgum, black gum, red maple, sweetbay magnolia, and water oak; shurbs are inkberry, southern wax myrtle, and titi.

Distribution and Extent Florida, Georgia, and possibly Alabama and South Carolina. The soil is of moderate extent.

Series Established Appling County, Georgia; 1969. Rev. TAR:MES, March 1975.

Remarks These soils were formerly included in the Rutlege series and classified in the Low-Humic Gley great soil group.

Appendix B. Description of Soils in Study Plots

This appendix contains brief descriptions of the soil series included in this study, location of specific plots, and a brief soil profile description of common vegetation.

Albany Series

Description The nonhydric Albany series is a member of the loamy, siliceous, thermic family of Grossarenic Paleudults. It consists of somewhat poorly drained, moderately permeable soils that formed in deposits of sandy and loamy sediments. The soils are nearly level to gently sloping. They are on broad flats and in undulating areas bordering poorly defined drainageways and swales on the uplands. The slope ranges from 0 to 5%. The water table is at a depth of 12 to 30 inches for 1 to 4 months in most years. Some areas are flooded occasionally for brief periods about 1 year in 10.

Albany—Plot No. 1

Location: Osceola National Forest, north side of FR262

Soil Description:

Ap—0 to 6 inches; grayish brown sand

E—6 to 58 inches; white sand

Btg—>58 inches; gray sandy clay loam with much oxidized mottling

Vegetation: Oaks/pines

Albany—Plot No. 2

Location: Osceola National Forest, southwest corner of FR262 on FR237 (T2S, R17E, S2)

Soil Description:

Ap—0 to 6 inches; grayish brown (10YR 5/2) fine sand; many fine roots

E1—1 to 18 inches; pale brown (10YR 6/3) sand

E2—19 to 55 inches; white (10YR 8/2) sand

Btg—>56 inches; light gray (10YR 7/2) sandy loam with common moderate yellowish brown mottles (10YR 5/6)

Vegetation: Oaks/pines

Albany—Plot No. 3

Location: Osceola National Forest FR262, ¼ mile east of FR237

Soil Description:

Ap1—0 to 4 inches; grayish brown (10YR 5/2) loamy sand

Ap2—4 to 10 inches; dark yellowish brown (10YR 3/4) loamy sand

E1—10 to 26 inches; grayish brown (10YR 5/2) loamy sand

E2—26 to 52 inches; light gray (10YR 7/2) loamy sand

Btg—>52 inches; light brownish gray (10YR 6/2) sandy loam with common moderate yellowish brown mottles (10YR 5/6)

Vegetation: Oaks/pines

Albany—Plot No. 4

Location: Osceola National Forest, north side of FR262 west of FR237

Soil Description:

Ap—0 to 6 inches; gray brown sand (10YR 5/2)

E—7 to 55 inches; white sand (10YR 8/2)

Btg—>56 inches; gray sandy clay loam (10YR 6/1) with brown mottles (10YR 5/6)

Vegetation: Oaks/pines

Croatan Series

Description Soils of the hydric Croatan series are sandy, siliceous, dystic, thermic Terric Medisaprists. These soils are organic and are very poorly drained. They are formed by decomposition of woody and herbaceous remains. These soils are on floodplains of major streams and in large hardwood swamps of the Coastal Plain. Water is at or near the surface throughout the year. Slopes are <2% (Howell 1984).

Croatan—Plot No. 1

Location: Osceola National Forest, southwest corner of FR263 and Fr 234 (T2S, R18E, S32)

Soil Description:

Oal—0 to 30 inches; very dark brown (10YR 2/2) sapric muck; 5% unrubbed fibers and <1% rubbed fibers; common fine roots; pH = 4.5

Oa2—30 to 40 inches; very dark gray (10YR 3/1); sapric muck; few fine roots; pH = 4.5

Btg—40 to 60+ inches; sandy clay; dark gray (5YR 4/1); few fine roots; pH = 4.5

Vegetation: Taxodium/Cyrilla/Lyonia

Croatan—Plot No. 2

Location: Osceola National Forest, I-10 at Falling Creek

Soil Description:

Oal—0 to 30 inches; very dark brown (10YR 2/2) sapric muck; 5% unrubbed fibers and <1% rubbed fibers; common fine roots; pH = 4.5

Oa2—30 to 40 inches; very dark gray (10YR 3/1); sapric muck; few fine roots; pH = 4.5

Btg—40 to 60+ inches; sandy clay; dark gray (5YR 4/1); few fine roots; pH = 4.5

Vegetation: Taxodium/Cyrilla/Lyonia

Croatan—Plot No. 3

Location: Osceola National Forest, 2.5 miles east of forest boundary on Interstate highway 10

Soil Description:

Oi—0 to 6 inches; fibric, black organic muck

Oe—6 to 12 inches; hemic, black organic muck

Oa1—12 to 20 inches; sapric, black organic muck

E—20 to 24 inches; gray sand

Btg—>24 inches; gray clay

Croatan—Plot No. 4

Location: Osceola National Forest, north of FR234 and FR272

Soil Description:

Oi—0 to 6 inches; fibric organic muck

Oa1—6 to 24 inches; black muck (10YR 2/1)

Oa2—24 to 34 inches; very dark grayish brown muck (10YR 3/2)

E—34 to 40 inches; gray sand (5YR 6/1)

Btg—>40 inches; gray sandy loam or sandy clay (5YR 6/1)

Mascotte Series

Description The hydric Mascotte soils are members of the sandy, siliceous, thermic family of Ultic Haplaquods. They consist of poorly drained, moderately permeable soils that formed in thick, sandy, and loamy marine deposits. These nearly level soils occur in flatwoods, along edges of swamps and depressions, and along rivers and streams. The slope ranges from 0 to 2%. The water table is at the surface to 1 foot below the surface during June through September most years. It is at a depth of 10 to 40 inches for periods up to 6 months and is below a depth of 40 inches during driest seasons.

Mascotte—Plot No. 1

Location: Osceola National Forest, 2 miles north of Interstate highway 10 (I-10) on FR235 (T2S, R19E, S26)

Soil Description:

Ap—0 to 5 inches; sand; black (10YR 2/1); many uncoated sand grains

E—5 to 15 inches; sand; light gray (10YR 6/1); single grained few fine roots

Bh—15 to 36 inches; black (10YR 2/1); single grained few fine roots

Btg—36+ inches; sandy loam; tan (10YR 6/2) medium orange mottles (10YR 6/6); concretions present

Vegetation: Pine flatwood (managed); slash pine, saw-palmetto, *Ilex glabra*

Mascotte—Plot No. 2

Location: Osceola National Forest, 1 mile south of FR250 and I-10, off FR250 on S-215, first dirt road on left

Soil Description:

Ap—0–6 inches; sand with high organic matter, black (7.5YR N2/), many roots

E—6 to 18 inches; light brownish gray (10YR 6/2) sand

Bh—18 to 26 inches; very dark grayish brown (10YR 3/2) sand
E′—26 to 37 inches; light gray (10YR 7/2) loamy sand with few fine, faint yellow mottles (10YR 7/6)
Btg—>37 inches; gray (10YR 6/1) sandy loam with many distinct yellow (10YR 7/6) mottles.

Vegetation: Pine flatwood (managed); slash pine, saw-palmetto, *Ilex glabra, Vaccinium myrsinites*

Mascotte—Plot No. 3

Location: Osceola National Forest, 2 miles south of FR263 on FR334

Soil Description:

Ap—0 to 6 inches; very dark brown (10YR 2/2) fine sand
E—6 to 24 inches; very dark brown (10YR 2/2) to grayish brown (10YR 5/2) sand
Bh—24 to 36 inches; very dark brown (10YR 2/2) sand
Btg—>36 inches; gray (10YR 6/1) sandy loam to sandy clay loam with many distinct yellow mottles (10YR 8/8)

Vegetation: Pine flatwood (managed); slash pine, saw-palmetto, *Ilex glabra, Lyonia lucida*

Mascotte—Plot No. 4

Location: Osceola National Forest, 1 mile north of FR285 on FR237

Soil Description:

Ap1—0 to 4 inches; black (10YR 2/1) sand; high organic matter
Ap2—4 to 8 inches; gray (10YR 5/1) sand stained with organic matter
E—8 to 22 inches; gray (10YR 6/1) sand
Bh—22 to 40 inches; black (10YR 3/2) sand
Btg—>40 inches; light gray (10YR 7/1) sandy clay loam

Vegetation: Pine flatwood (managed)

Mascotte—Plot No's. 5–8

Location: All plots located in Bradford Forest, Florida

Soil Description: (composite)

Ap—0 to 5 inches; black sand stained with organic matter
E—5 to 21 inches; light gray sand
Bh—21 to 28 inches; black sand, weakly cemented
E′—28 to 38 inches; light gray sand
Btg—>38 inches; gray sandy loam to sandy clay loam

Vegetation: Pine flatwood (unmanaged), slash pine, *Ilex glabra, Vaccinium myrsinites*

Ocilla Series

Description The nonhydric Ocilla series is a member of the loamy, siliceous, thermic family of Aquic Arenic Paleudults. The Ocilla series consist of somewhat poorly drained, moderately permeable soils formed in sandy and loamy marine sediments. These soils formed on low uplands and stream terraces. Slopes range from 0 to 5%. Mean annual temperature is about 67° F, and mean annual precipitation is about 46 inches.

Ocilla—Plot No. 1

Location: Osceola National Forest, Lake Butler Wildlife Management Area

Soil Description:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sand
A—8 to 12 inches; dark brown (10YR 4/3) fine sand
E—12 to 34 inches; very pale brown (10YR 7/4) fine sand
Bt—>34 inches; very pale brown (10YR 7/4) sandy clay loam with common distinct mottles (10YR 8/4)

Vegetation: Slash pine, wax myrtle, *Lyonia lucida*

Ocilla—Plot No. 2

Location: Osceola National Forest, at Turtle Bay at junction of FR237 and FR236

Soil Description:

Ap—0 to 3 inches; black (10YR 2/1) fine sand
A1—3 to 7 inches; very dark grayish brown (10YR 3/2) fine sand
A2—7 to 12 inches; dark yellowish brown (10YR 3/4) fine sand
E—12 to 43 inches; pale brown (10YR 6/3) fine sand
Bt—43 to 48 inches; light gray (10YR 7/2) sandy clay loam with distinct brownish yellow (10YR 6/6) mottles

Vegetation: Oaks/pines

Ocilla—Plot No. 3

Location: Osceola National Forest, 1 mile north of FR202 on FR245

Soil Description:

Ap—0 to 2 inches; brown (10YR 5/3) sand with organic matter

E1—2 to 10 inches; very pale brown (10YR 7/4) sand

E2—10 to 32 inches; brown (10YR 5/3) sand

Bt—32 to 34 inches; yellow (10YR 7/6) sandy clay loam with few light gray (10YR 7/2) mottles

Btg—>34 inches; light gray (10YR 7/2) sand with few high chroma mottles

Vegetation: Oak/pines

Ocilla—Plot No. 4

Location: Osceola National Forest, 1 mile south of FR245 on FR202

Soil Description:

Ap—0 to 2 inches; gray (10YR 5/1) sand

E1—2 to 18 inches; yellowish brown (10YR 5/4) sand

E2—18 to 38 inches; pale brown (10YR 6/3) sand

Bt—>38 inches; brownish yellow (10YR 6/8) sandy loam

Vegetation: Pines/oaks/sweetgum

Sapelo Series

Description The hydric Sapelo series is a member of the sandy, siliceous, thermic family of Ultic Haplaquods. These soils consist of nearly level, poorly drained, acid soils that formed in thick deposits of loamy marine sediments. These soils occur in broad flatwood areas. Slopes are smooth to convex and range from 0 to 2%. Under natural conditions, the water table is at a depth of <10 inches for 2 to 4 months or more, and at a depth of 10 to 30 inches for 2 to 6 months during most years.

Sapelo—Plot No. 1

Location: Osceola National Forest, 1 mile east of FR234 on FR263

Soil Description:

Ap—0 to 3 inches; black (10YR 2/1) sand stained with organic matter

E—3 to 14 inches; gray (10YR 6/1) sand

Bh—14 to 42 inches; black (10YR 2/1) sand

Btg—>42 inches; light brownish gray (10YR 6/2) sandy loam with brownish yellow mottles

Vegetation: Pine flatwood (managed)

Sapelo—Plot No. 2

Location: Osceola National Forest, 2 miles east of FR234 on FR263

Soil Description:

Ap—0 to 4 inches; black (10YR 2/1) fine sand stained with organic matter

E—4 to 22 inches; gray (10YR 5/1) sand

Bh1—22 to 28 inches; black (10YR 2/1) slightly compacted sand

Bh2—28 to 41 inches; brown (10YR 5/3) sand

Bt—>41 inches; brown tan (10YR 5/3) sandy loam

Vegetation: Pine flatwood (managed); slash pine, saw-palmetto, *Ilex glabra*

Sapelo—Plot No. 3

Location: Osceola National Forest, 1 mile south of FR245 on FR202

Soil Description:

Ap—0 to 20 inches; very dark brown (10YR 2/2) sand

E—20 to 28 inches; dark gray (10YR 4/1) sand

Bh—28 to 38 inches; very dark brown (10YR 2/2) sand

E′—38 to 75 inches; very pale brown (10YR 7/3) sand

Btg—>75 inches; gray (10YR 6/1) sandy clay loam

Vegetation: Pine flatwood (managed); slash and loblolly pine, *Ilex glabra*

Sapelo—Plot No. 4

Location: Osceola National Forest, ½ mile south of FR202 on FR250

Soil Description:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sand

E—8 to 18 inches; grayish brown (10YR 5/2) sand
Bh1—18 to 24 inches; very dark brown (10YR 2/2) sand
Bh2—24 to 36 inches; dark yellowish brown (10YR 4/4) sand
E′—36 to 44 inches; yellowish brown (10YR 5/6) sand
Btg—>44 inches; gray (10YR 6/1) sandy clay loam

Vegetation: Pine flatwood (managed); slash pine, saw-palmetto, *Ilex glabra*

Sapelo—Plot No's. 5–8

Location: All four plots were located in University of Florida's Austin Cary Forest on Waldo Road northeast of Gainesville, Florida

Soil Description:

Ap—0 to 8 inches; black (10YR 2/1) sand stained with organic matter
E—8 to 20 inches; gray (10YR 2/1) sand
Bh—20 to 38 inches; black (10YR 2/1) weakly compacted sand
E′—38 to 50 inches; gray (10YR 6/1) sand
Btg—>50 inches; grayish brown (10YR 5/2) sandy clay loam with common high chroma mottles

Vegetation: Pine flatwoods (unmanaged); longleaf and slash pine, saw-palmetto, *Ilex glabra*

Surrency Series

Description The hydric Surrency soils are members of the loamy, siliceous, thermic family of Arenic Umbric Paleaquults. They consist of very poorly drained, moderately permeable soils that formed in marine deposits of loamy materials. These nearly level soils occur along upland drainageways, in depressions, and in shallow ponds. The slope is <1%. The water table is at the surface for long periods each year with common flooding and ponding most years.

Surrency Plot No. 1

Location: Osceola National Forest, 2 miles north of Interstate highway 10 FR235 (T2S, R19E, S26)

Soil Description:

A—0 to 30 inches; black (10YR 2/1); fine sand; high in organic matter
E—30 to 38 inches; dark yellowish brown (10YR 4/4); fine sand
B2g—38+ inches; grayish brown (10YR 1/4) sandy clay loam; few to common fine roots

Vegetation: Thick *Lyonia lucida*, cypress, and loblolly bay

Surrency—Plot No. 2

Location: Osceola National Forest, southwest corner of FR234 and FR236, near open area

Soil Description:

O1—0 to 6 inches; black (10YR 2/1) mucky loam with high percent organic fibers
A—6 to 16 inches; black (10YR 2/1) loam; estimate 20% organic matter
E—16 to 22 inches; grayish brown (10YR 5/2) sand
Btg—>22 inches; dark gray (10YR 4/1) sandy clay loam; no high chroma mottles; strongly gleyed

Vegetation: Cypress, slash pines, black gum, maple

Surrency—Plot No. 3

Location: Osceola National Forest, FR250, 1 mile east of Still Road

Soil Description:

Ol—0 to 6 inches; dark reddish brown (2.5YR 2/4) muck with pine straw and organic fibers
A—6 to 18 inches; very dark brown (10YR 2/2) mucky loam high in organic matter
E—18 to 36 inches; dark grayish brown (10YR 4/2) sandy loam
Btg—>36 inches; grayish brown (10YR 5/2) sandy clay loam

Vegetation: Cypress

Surrency—Plot No. 4

Location: Osceola National Forest, FR285 ¼ mile east of western forest boundary (T1S, R17E, S22)

Soil Description:

O—0 to 7 inches; black (10YR 2/1) mucky loam
A—7 to 18 inches; black (10YR 2/1) sand stained with organic matter
E1—18 to 24 inches; brown (10YR 5/3) sand
E2—24 to 35 inches; very pale brown (10YR 7/3) sand
Btg—>35 inches; light brownish gray (10YR 6/2) sandy clay loam with fine roots

Vegetation: Cypress

Appendix C. Species Composition for Tree and Shrub Strata

Index refers to standard wetland indicator status for each species, based on Reed (1988). Frequency is the number of plots in which species appeared and has a maximum value of 5. Densities are actual numbers sampled in each of five 100-m² plots for trees, each of five 4-m² plots for shrubs. Basal area is in centimeters per 100-m² plot.

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot					Basal area by plot				
							1	2	3	4	5	1	2	3	4	5
Croatan	Osceola	1	Tree	*Ilex myrtifolia*	2	1	1	—	—	—	—	104	—	—	—	—
Croatan	Osceola	1		*Nyssa sylvatica* var. *biflora*	3	5	19	19	26	15	23	2,182	2,220	3,163	3,281	10,857
Croatan	Osceola	1		*Pinus elliottii*	2	4	2	1	2	1	—	4,669	707	993	269	—
Croatan	Osceola	1		*Gordonia lasianthus*	2	3	—	—	2	1	3	2,761	2,646	898	2,046	—
Croatan	Osceola	1	T-Shrub	*Lyonia lucida*	2	5	3	6	12	3	12					
Croatan	Osceola	1	S-Shrub	*Lyonia lucida*	2	5	3	12	18	10	18					
Croatan	Osceola	1		*Gordonia lasianthus*	2	1	—	1	—	—	—					
Croatan	Osceola	1		*Smilax bona-nox*	2	2	—	1	1	—	—					
Croatan	Osceola	1		*Itea virginica*	2	4	—	1	2	3	1					
Croatan	Osceola	1		*Clethra alnifolia*	2	2	—	—	2	1	—					
Croatan	Osceola	1		*Persea borbonia*	2	1	—	—	—	1	—					
Croatan	Osceola	2	Tree	*Acer rubrum*	3	3	2	3	2	—	—	228	364	208	—	—
Croatan	Osceola	2		*Ilex cassine*	2	2	3	—	—	—	2	270	—	—	—	173
Croatan	Osceola	2		*Magnolia virginiana*	2	4	1	6	4	—	1	64	1,227	778	—	572
Croatan	Osceola	2		*Nyssa sylvatica* var. *biflora*	3	5	13	7	12	21	11	1,875	3,107	3,457	6,485	3,838
Croatan	Osceola	2		*Taxodium distichum*	1	3	1	3	—	1	—	1,886	1,732	—	78	—
Croatan	Osceola	2	T-Shrub	*Leucothoe racemosa*	2	4	—	2	2	4	3					
Croatan	Osceola	2		*Lyonia lucida*	2	4	—	11	9	5	2					
Croatan	Osceola	2		*Myrica cerifera*	3	1	—	1	—	—	—					
Croatan	Osceola	2	S-Shrub	*Lyonia lucida*	2	5	2	2	17	13	5					
Croatan	Osceola	2		*Leucothoe racemosa*	2	3	—	3	1	—	2					
Croatan	Osceola	3	Tree	*Acer rubrum*	3	3	1	7	—	2	—	1,134	1,212	—	248	—
Croatan	Osceola	3		*Magnolia virginiana*	2	5	3	1	3	2	1	523	491	836	1,025	314
Croatan	Osceola	3		*Nyssa sylvatica* var. *biflora*	3	5	15	11	10	9	7	2,364	3,266	4,090	2,684	2,129
Croatan	Osceola	3		*Pinus elliottii*	2	3	1	—	—	1	2	1,698	—	—	201	1,095
Croatan	Osceola	3		*Taxodium distichum*	1	5	1	2	3	5	1	189	3,698	1,332	1,722	1,075
Croatan	Osceola	3		*Ilex cassine*	2	2	—	1	1	—	—	—	78	44	—	—
Croatan	Osceola	3		*Ilex myrtifolia*	2	2	—	1	—	—	2	—	64	—	—	255
Croatan	Osceola	3		*Persea borbonia (palustris?)*	2	1	—	1	—	—	—	—	87	—	—	—

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Croatan	Osceola	3	T-Shrub	*Lyonia lucida*	2	4	1	—	3	10	5					
Croatan	Osceola	3		*Leucothoe racemosa*	2	1	—	—	2	—	—					
Croatan	Osceola	3	S-Shrub	*Lyonia lucida*	2	4	3	—	3	10	6					
Croatan	Osceola	4	Tree	*Nyssa sylvatica* var. *biflora*	3	5	2	6	11	1	2	114	783	735	143	240
Croatan	Osceola	4		*Persea borbonia (palustris?)*	2	1	3	—	—	—	—	223	—	—	—	—
Croatan	Osceola	4		*Taxodium distichum*	1	5	4	8	3	12	3	944	865	2,027	6,655	2,620
Croatan	Osceola	4		*Pinus elliottii*	2	1	—	—	—	1	—	—	—	—	64	—
Croatan	Osceola	4	T-Shrub	*Lyonia lucida*	2	3	3	—	—	4	13					
Croatan	Osceola	4		*Taxodium distichum*	1	1	2	—	—	—	—					
Croatan	Osceola	4		*Nyssa sylvatica* var. *biflora*	3	1	1	—	—	—	—					
Croatan	Osceola	4		*Persea borbonia*	2	1	—	—	1	—	—					
Croatan	Osceola	4		*Clethra alnifolia*	2	1	—	—	—	5	—					
Croatan	Osceola	4		*Leucothoe racemosa*	2	1	—	—	—	1	—					
Croatan	Osceola	4		*Myrica cerifera*	3	1	—	—	—	—	1					
Croatan	Osceola	4	S-Shrub	*Lyonia lucida*	2	4	6	—	3	5	12					
Croatan	Osceola	4		*Leucothoe racemosa*	2	1	—	1	—	—	—					
Croatan	Osceola	4		*Clethra alnifolia*	2	3	—	—	6	2	2					
Surrency	Osceola	1	Tree	*Ilex myrtifolia*	2	1	1	—	—	—	—	50	—	—	—	—
Surrency	Osceola	1		*Nyssa sylvatica* var. *biflora*	3	5	25	18	6	8	2	7,699	3,380	3,445	2,015	642
Surrency	Osceola	1		*Persea borbonia (palustris?)*	2	2	2	1	—	—	—	296	284	—	—	—
Surrency	Osceola	1		*Pinus elliottii*	2	2	—	1	—	—	1	—	201	—	—	755
Surrency	Osceola	1		*Taxodium distichum*	1	4	—	8	5	4	3	—	4,995	4,581	2,857	4,326
Surrency	Osceola	1		*Gordonia lasianthus*	2	2	—	—	1	—	4	—	—	64	—	1,341
Surrency	Osceola	1	T-Shrub	*Lyonia lucida*	2	5	8	2	2	5	4					
Surrency	Osceola	1		*Vaccinium elliottii*	3	1	—	—	2	—	—					
Surrency	Osceola	1	S-Shrub	*Lyonia lucida*	2	5	23	11	11	8	6					
Surrency	Osceola	1		*Nyssa sylvatica* var. *biflora*	3	1	—	6	—	—	—					
Surrency	Osceola	1		*Vaccinium elliottii*	3	1	—	—	2	—	—					
Surrency	Osceola	1		*Itea virginica*	2	1	—	—	—	11	—					
Surrency	Osceola	2	Tree	*Gordonia lasianthus*	2	2	1	—	—	—	1	78	—	—	—	165
Surrency	Osceola	2		*Ilex cassine*	2	1	2	—	—	—	—	370	—	—	—	—
Surrency	Osceola	2		*Nyssa sylvatica* var. *biflora*	3	5	8	15	10	11	10	769	2,527	1,286	1,269	1,139
Surrency	Osceola	2		*Persea borbonia (palustris?)*	2	4	5	1	2	5	—	441	201	336	906	—

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Surrency	Osceola	2		*Pinus elliottii*	2	5	5	5	8	7	2	2,827	2,469	4,883	8,918	3,406
Surrency	Osceola	2		*Ilex myrtifolia*	2	2	—	1	—	3	—	—	64	—	157	—
Surrency	Osceola	2		*Magnolia virginiana*	2	2	—	1	—	—	9	—	201	—	—	1,049
Surrency	Osceola	2		*Taxodium distichum*	1	2	—	1	7	—	—	—	283	1,368	—	—
Surrency	Osceola	2	T-Shrub	*Lyonia lucida*	2	4	3	4	—	8	1					
Surrency	Osceola	2		*Clethra alnifolia*	2	1	—	—	—	1	—					
Surrency	Osceola	2		*Persea borbonia*	2	1	—	—	—	—	1					
Surrency	Osceola	2	S-Shrub	*Lyonia lucida*	2	5	16	8	9	8	2					
Surrency	Osceola	2		*Persea borbonia*	2	1	1	—	—	—	—					
Surrency	Osceola	2		*Clethra alnifolia*	2	1	—	—	—	3	—					
Surrency	Osceola	3	Tree	*Nyssa sylvatica* var. *biflora*	3	5	19	3	1	2	8	3,444	957	133	284	2,362
Surrency	Osceola	3		*Pinus elliottii*	2	2	5	2	—	—	—	4,897	1,364	—	—	—
Surrency	Osceola	3		*Taxodium distichum*	1	5	6	11	12	5	10	1,042	5,793	4,918	5,225	5,023
Surrency	Osceola	3		*Cephalanthus occidentalis*	1	1	—	—	—	1	—	—	—	—	78	—
Surrency	Osceola	3		*Persea borbonia (palustris?)*	2	1	—	—	—	1	—	—	—	—	64	—
Surrency	Osceola	3	T-Shrub	*Lyonia lucida*	2	2	—	—	1	—	2					
Surrency	Osceola	3		*Leucothoe racemosa*	2	3	2	3	1	—	—					
Surrency	Osceola	3	S-Shrub	*Lyonia lucida*	2	2	—	8	—	—	6					
Surrency	Osceola	3		*Leucothoe racemosa*	2	2	—	5	4	—	—					
Surrency	Osceola	3		*Ilex cassine*	2	1	—	—	1	—	—					
Surrency	Osceola	4	Tree	*Nyssa sylvatica* var. *biflora*	3	5	9	7	3	12	1	1,940	772	792	3,453	133
Surrency	Osceola	4		*Taxodium distichum*	1	5	10	10	13	11	19	3,472	4,975	3,195	3,057	5,538
Surrency	Osceola	4		*Pinus elliottii*	2	1	—	3	—	—	—	—	1,030	—	—	—
Surrency	Osceola	4	T-Shrub	*Lyonia lucida*	2	4	6	5	—	3	7					
Surrency	Osceola	4		*Leucothoe racemosa*	2	2	3	4	—	—	—					
Surrency	Osceola	4		*Clethra alnifolia*	2	4	3	3	1	4	—					
Surrency	Osceola	4		*Myrica cerifera*	3	2	—	—	—	4	2					
Surrency	Osceola	4		*Ilex glabra*	2	1	—	—	—	1	—					
Surrency	Osceola	4	S-Shrub	*Lyonia lucida*	2	5	8	5	5	9	12					
Surrency	Osceola	4		*Clethra alnifolia*	2	5	5	1	3	1	—					
Surrency	Osceola	4		*Leucothoe racemosa*	2	2	1	—	—	2	—					
Surrency	Osceola	4		*Ilex cassine*	2	1	5	—	—	—	—					
Surrency	Osceola	4		*Pieris phyllyreifolia*	2	2	—	—	3	2	—					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Mascotte	Osceola	1	Tree	*Pinus elliottii*	2	5	5	5	12	8	1	792	509	1,443	993	660
Mascotte	Osceola	1	T-Shrub	*Ilex glabra*	2	5	4	7	2	13	10					
Mascotte	Osceola	1	S-Shrub	*Ilex glabra*	2	5	29	58	42	65	74					
Mascotte	Osceola	1		*Gaylussacia tomentosa*	5	4	—	20	20	7	4					
Mascotte	Osceola	1		*Vaccinium/Gaylussacia* spp.	—	3	—	8	—	2	13					
Mascotte	Osceola	1		*Serenoa repens*	4	2	—	—	8	11	—					
Mascotte	Osceola	1		*Vitis rotundifolia*	3	1	—	—	—	—	2					
Mascotte	Osceola	2	Tree	*Pinus elliottii*	2	5	4	3	4	5	2	2,937	2,369	2,040	3,983	1,246
Mascotte	Osceola	2	T-Shrub	*Myrica cerifera*	3	1	1	—	—	—	—					
Mascotte	Osceola	2	S-Shrub	*Ilex glabra*	2	5	11	11	5	6	1					
Mascotte	Osceola	2		*Serenoa repens*	4	4	2	—	4	11	8					
Mascotte	Osceola	2		*Vaccinium/Gaylussacia* spp.	—	1	—	—	4	—	—					
Mascotte	Osceola	2		*Vitis rotundifolia*	3	1	—	—	—	—	1					
Mascotte	Osceola	3	Tree	*Pinus elliottii*	2	5	2	4	3	5	5	2,345	2,231	3,255	4,105	3,388
Mascotte	Osceola	3	T-Shrub	*Ilex glabra*	2	5	13	32	10	1	2					
Mascotte	Osceola	3		*Persea borbonia*	2	1	—	—	—	1	—					
Mascotte	Osceola	3	S-Shrub	*Myrica cerifera*	3	2	7	—	—	1	—					
Mascotte	Osceola	3		*Serenoa repens*	4	5	6	9	11	13	10					
Mascotte	Osceola	3		*Ilex glabra*	2	4	—	12	14	13	15					
Mascotte	Osceola	3		*Lyonia lucida*	2	4	—	1	3	21	4					
Mascotte	Osceola	3		*Vaccinium/Gaylussacia* spp.	—	2	—	12	3	—	—					
Mascotte	Osceola	3		*Gordonia lasianthus*	2	1	—	—	1	—	—					
Mascotte	Osceola	4	Tree	*Pinus elliottii*	2	5	8	11	6	6	10	2,193	4,394	2,212	761	3,342
Mascotte	Osceola	4		*Gordonia lasianthus*	2	1	—	—	—	3	—	—	—	—	374	—
Mascotte	Osceola	4	T-Shrub	*Ilex glabra*	2	3	—	—	10	1	4					
Mascotte	Osceola	4	S-Shrub	*Serenoa repens*	4	5	12	12	8	9	4					
Mascotte	Osceola	4		*Lyonia ferruginea*	3	2	1	—	—	—	2					
Mascotte	Osceola	4		*Vaccinium/Gaylussacia* spp.	—	4	11	5	1	1	—					
Mascotte	Osceola	4		*Ilex glabra*	2	3	—	—	28	1	10					
Mascotte	Osceola	4		*Vaccinium myrsinites*	4	3	—	—	2	1	1					
Mascotte	Bradford	1	Tree	*Pinus elliottii*	2	5	7	2	4	4	11	3,092	668	1,283	1,366	1,696
Mascotte	Bradford	1	T-Shrub	*Ilex glabra*	2	5	2	14	6	5	13					
Mascotte	Bradford	1		*Ilex coriacea*	2	1	—	2	—	—	—					
Mascotte	Bradford	1		*Myrica cerifera*	3	1	—	3	—	—	—					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Mascotte	Bradford	1		*Persea borbonia*	2	3	—	1	1	1	—					
Mascotte	Bradford	1		*Gaylussacia frondosa*	3	1	—	—	—	1	—					
Mascotte	Bradford	1		*Magnolia virginiana*	2	1	—	—	—	—	1					
Mascotte	Bradford	1		*Lyonia ferruginea*	3	1	—	—	—	1	—					
Mascotte	Bradford	1	S-Shrub	*Ilex glabra*	2	4	11	44	40	—	26					
Mascotte	Bradford	1		*Serenoa repens*	4	2	3	—	1	—	—					
Mascotte	Bradford	1		*Myrica cerifera*	3	1	—	2	—	—	—					
Mascotte	Bradford	1		*Ilex coriacea*	2	1	—	2	—	—	—					
Mascotte	Bradford	1		*Gaylussacia frondosa*	3	2	—	—	—	14	11					
Mascotte	Bradford	1		*Lyonia fruticosa*	3	1	—	—	—	5	—					
Mascotte	Bradford	2	Tree	*Pinus elliottii*	2	4	—	13	4	8	1	—	2,710	1,079	1,802	491
Mascotte	Bradford	2		*Persea borbonia*	2	1	—	—	1	—	—	—	—	50	—	—
Mascotte	Bradford	2	T-Shrub	*Serenoa repens*	4	1	—	—	1	—	—					
Mascotte	Bradford	2		*Lyonia ferruginea*	3	1	—	—	1	—	—					
Mascotte	Bradford	2		*Lyonia lucida*	2	1	—	4	—	—	—					
Mascotte	Bradford	2		*Ilex glabra*	2	2	—	6	—	—	3					
Mascotte	Bradford	2	S-Shrub	*Lyonia ferruginea*	3	1	1	—	—	—	—					
Mascotte	Bradford	2		*Ilex glabra*	2	4	9	18	—	17	28					
Mascotte	Bradford	2		*Rhododendron canescens*	2	1	—	2	—	—	—					
Mascotte	Bradford	2		*Lyonia lucida*	2	2	—	29	—	1	—					
Mascotte	Bradford	2		*Serenoa repens*	4	3	—	—	11	3	8					
Mascotte	Bradford	2		*Gaylussacia frondosa*	3	2	—	—	—	1	6					
Mascotte	Bradford	2		*Vaccinium myrsinites*	4	1	—	—	—	1	—					
Mascotte	Bradford	2		*Persea borbonia*	2	1	—	—	—	—	1					
Mascotte	Bradford	3	Tree	*Pinus elliottii*	2	5	12	11	8	17	4	4,316	1,766	2,018	3,510	1,497
Mascotte	Bradford	3		*Ilex myrtifolia*	2	2	—	1	—	1	—	—	50	—	50	—
Mascotte	Bradford	3		*Magnolia virginiana*	2	1	—	1	—	—	—	—	64	—	—	—
Mascotte	Bradford	3	T-Shrub	*Ilex coriacea*	2	2	—	1	—	—	3					
Mascotte	Bradford	3		*Ilex glabra*	2	3	—	—	4	4	4					
Mascotte	Bradford	3		*Ilex myrtifolia*	2	2	—	—	—	1	1					
Mascotte	Bradford	3		*Vaccinium corymbosum*	2	2	—	—	—	1	1					
Mascotte	Bradford	3		*Diospyros virginiana*	3	1	—	—	—	—	1					
Mascotte	Bradford	3		*Lyonia lucida*	2	1	—	—	—	—	4					
Mascotte	Bradford	3	S-Shrub	*Ilex glabra*	2	5	39	5	11	6	14					
Mascotte	Bradford	3		*Vaccinium elliottii*	3	1	1	—	—	—	—					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Mascotte	Bradford	3		*Ilex coriacea*	2	2	—	6	—	2	—					
Mascotte	Bradford	3		*Serenoa repens*	4	2	—	3	—	1	—					
Mascotte	Bradford	3		*Lyonia lucida*	2	4	—	1	9	2	44					
Mascotte	Bradford	3		*Ilex myrtifolia*	2	2	—	—	1	2	—					
Mascotte	Bradford	3		*Vaccinium corymbosum*	2	1	—	—	—	—	1					
Mascotte	Bradford	4	Tree	*Pinus elliottii*	2	5	18	19	6	6	3	3,079	4,254	832	1,268	622
Mascotte	Bradford	4		*Pinus palustris*	4	4	2	—	13	5	3	362	—	2,395	731	574
Mascotte	Bradford	4		*Ilex myrtifolia*	2	1	—	—	1	—	—	—	—	50	—	—
Mascotte	Bradford	4		*Myrica cerifera*	3	1	—	—	—	—	1	—	—	—	—	64
Mascotte	Bradford	4	T-Shrub	*Quercus laurifolia*	2	1	1	—	—	—	—					
Mascotte	Bradford	4		*Lyonia lucida*	2	1	1	—	—	—	—					
Mascotte	Bradford	4		*Ilex glabra*	2	3	1	4	—	4	—					
Mascotte	Bradford	4		*Vaccinium corymbosum*	2	1	—	—	—	1	—					
Mascotte	Bradford	4	S-Shrub	*Ilex coriacea*	2	1	2	—	—	—	—					
Mascotte	Bradford	4		*Lyonia lucida*	2	3	50	5	—	1	—					
Mascotte	Bradford	4		*Ilex glabra*	2	5	4	17	7	13	38					
Mascotte	Bradford	4		*Serenoa repens*	4	4	—	3	5	5	1					
Mascotte	Bradford	4		*Gaylussacia frondosa*	3	1	—	4	—	—	—					
Mascotte	Bradford	4		*Gaylussacia dumosa*	3	1	—	6	—	—	—					
Mascotte	Bradford	4		*Myrica cerifera*	3	1	—	—	—	1	—					
Mascotte	Bradford	4		*Persea borbonia*	2	1	—	—	—	1	—					
Mascotte	Bradford	4		*Vaccinium myrsinites*	4	1	—	—	—	—	1					
Sapelo	Osceola	1	Tree	*Pinus elliottii*	2	5	4	3	3	4	2	1,678	1,960	1,929	834	1,257
Sapelo	Osceola	1	T-Shrub													
Sapelo	Osceola	1	S-Shrub	*Serenoa repens*	4	5	13	3	10	9	8					
Sapelo	Osceola	1		*Itea virginica*	2	1	1	—	—	—	—					
Sapelo	Osceola	1		*Lyonia fruticosa*	3	2	1	—	2	—	—					
Sapelo	Osceola	1		*Quercus virginiana*	4	1	2	—	—	—	—					
Sapelo	Osceola	1		*Ilex glabra*	2	2	—	4	—	108	—					
Sapelo	Osceola	1		*Ilex coriacea*	2	1	—	1	—	—	—					
Sapelo	Osceola	1		*Befaria racemosa*	3	3	—	—	5	2	1					
Sapelo	Osceola	1		*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	1	—					
Sapelo	Osceola	2	Tree	*Pinus elliottii*	2	5	7	3	9	6	3	2,953	830	3,256	2,538	2,009
Sapelo	Osceola	2	T-Shrub	*Ilex glabra*	2	1	—	3	—	—	—					
Sapelo	Osceola	2	S-Shrub	*Serenoa repens*	4	5	4	11	1	6	4					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Sapelo	Osceola	2		*Lyonia fruticosa*	3	2	1	1	—	—	—					
Sapelo	Osceola	2		*Ilex glabra*	2	4	1	16	29	—	86					
Sapelo	Osceola	2		*Vaccinium corymbosum*	2	1	—	2	—	—	—					
Sapelo	Osceola	2		*Befaria racemosa*	3	1	—	—	—	3	—					
Sapelo	Osceola	2		*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	2	—					
Sapelo	Osceola	3	Tree	*Pinus elliottii*	2	4	4	1	2	1	—	1,872	638	1,231	638	—
Sapelo	Osceola	3		*Pinus taeda*	3	5	1	1	3	1	2	855	1,257	1,504	908	2,152
Sapelo	Osceola	3	T-Shrub	*Ilex glabra*	2	4	5	1	6	4	—					
Sapelo	Osceola	3		*Diospyros virginiana*	3	1	1	—	—	—	—					
Sapelo	Osceola	3		*Acer rubrum*	3	1	—	—	1	—	—					
Sapelo	Osceola	3	S-Shrub	*Ilex glabra*	2	4	16	18	11	31	—					
Sapelo	Osceola	3		*Smilax glauca*	3	3	4	—	2	3	—					
Sapelo	Osceola	3		*Serenoa repens*	4	4	2	10	3	—	4					
Sapelo	Osceola	3		*Gelsemium sempervirens*	3	2	—	4	1	—	—					
Sapelo	Osceola	3		*Lyonia lucida*	2	1	—	—	9	—	—					
Sapelo	Osceola	3		*Vaccinium/Gaylussacia* spp.	—	2	—	—	3	4	—					
Sapelo	Osceola	3		*Gelsemium sempervirens*	3	2	—	4	1	—	—					
Sapelo	Osceola	3		*Rhododendron canescens*	2	1	—	—	1	—	—					
Sapelo	Osceola	3		*Vaccinium corymbosum*	2	1	—	—	—	7	—					
Sapelo	Osceola	3		*Lyonia fruticosa*	3	1	—	—	—	—	2					
Sapelo	Osceola	4	Tree	*Pinus elliottii*	2	5	5	2	1	5	3	3,523	850	1,046	3,493	1,920
Sapelo	Osceola	4	S-Shrub	*Ilex glabra*	2	5	27	26	29	7	5					
Sapelo	Osceola	4		*Serenoa repens*	4	4	7	8	8	—	10					
Sapelo	Osceola	4		*Vaccinium/Gaylussacia* spp.	—	3	2	—	3	—	5					
Sapelo	Osceola	4		*Vaccinium myrsinites*	4	2	—	2	—	—	1					
Sapelo	Osceola	4		*Lyonia ferruginea*	3	1	—	—	1	—	—					
Sapelo	Osceola	4		*Quercus virginiana*	4	1	—	—	—	1	—					
Sapelo	Osceola	4		*Lyonia fruticosa*	3	1	—	—	—	—	3					
Sapelo	Austin Cary	1	Tree	*Pinus elliottii*	2	3	8	22	6	—	—	1,922	3,768	799	—	—
Sapelo	Austin Cary	1		*Pinus palustris*	4	3	2	—	—	7	6	644	—	—	2,115	1,996
Sapelo	Austin Cary	1		*Gordonia lasianthus*	2	1	—	—	—	1	—	—	—	—	79	—
Sapelo	Austin Cary	1	T-Shrub	*Pinus elliottii*	2	1	1	—	—	—	—					
Sapelo	Austin Cary	1		*Lyonia lucida*	2	2	—	—	1	—	1					
Sapelo	Austin Cary	1		*Ilex glabra*	2	3	—	1	2	—	6					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot					Basal area by plot				
							1	2	3	4	5	1	2	3	4	5
Sapelo	Austin Cary	1	S-Shrub	*Serenoa repens*	4	5	3	11	4	9	8					
Sapelo	Austin Cary	1		*Lyonia lucida*	2	5	8	2	4	4	5					
Sapelo	Austin Cary	1		*Persea borbonia*	2	1	—	1	—	—	—					
Sapelo	Austin Cary	1		*Lyonia ferruginea*	3	1	—	7	—	—	—					
Sapelo	Austin Cary	1		*Ilex glabra*	2	4	—	2	10	3	5					
Sapelo	Austin Cary	1		*Gaylussacia frondosa*	3	1	—	—	—	2	—					
Sapelo	Austin Cary	2	Tree	*Pinus elliottii*	2	4	2	4	7	1	—	1,361	2,794	1,181	177	—
Sapelo	Austin Cary	2		*Pinus palustris*	4	4	1	—	1	3	13	531	—	314	701	4,287
Sapelo	Austin Cary	2		*Ilex opaca*	3	1	—	—	—	1	—	—	—	—	154	—
Sapelo	Austin Cary	2	T-Shrub	*Ilex glabra*	2	3	2	5	—	—	1					
Sapelo	Austin Cary	2		*Lyonia lucida*	2	4	2	3	2	—	1					
Sapelo	Austin Cary	2		*Ilex coriacea*	2	1	—	2	—	—	—					
Sapelo	Austin Cary	2		*Pinus elliottii*	2	1	—	—	1	—	—					
Sapelo	Austin Cary	2	S-Shrub	*Ilex glabra*	2	4	6	4	2	—	2					
Sapelo	Austin Cary	2		*Serenoa repens*	4	4	5	—	4	6	4					
Sapelo	Austin Cary	2		*Lyonia lucida*	2	4	—	12	12	5	11					
Sapelo	Austin Cary	2		*Gaylussacia frondosa*	3	1	—	1	—	—	—					
Sapelo	Austin Cary	3	Tree	*Pinus elliottii*	2	3	—	—	2	4	2	—	—	729	1,251	142
Sapelo	Austin Cary	3		*Pinus palustris*	4	5	6	12	3	5	6	2,326	4,198	822	2,384	2,278
Sapelo	Austin Cary	3		*Acer rubrum*	3	1	—	1	—	—	—	—	50	—	—	—
Sapelo	Austin Cary	3		*Ilex cassine*	2	—	1	—	—	—	2	—	—	—	101	—
Sapelo	Austin Cary	3	T-Shrub	*Ilex glabra*	2	2	—	—	3	3	—					
Sapelo	Austin Cary	3		*Lyonia ferruginea*	3	1	—	—	1	—	—					
Sapelo	Austin Cary	3	S-Shrub	*Serenoa repens*	4	5	7	3	4	9	7					
Sapelo	Austin Cary	3		*Ilex glabra*	2	5	13	4	10	9	1					
Sapelo	Austin Cary	3		*Myrica cerifera*	3	1	—	1	—	—	—					
Sapelo	Austin Cary	3		*Persea borbonia*	2	1	—	4	—	—	—					
Sapelo	Austin Cary	3		*Gaylussacia frondosa*	3	1	—	—	1	—	—					
Sapelo	Austin Cary	4	Tree	*Pinus elliottii*	2	3	1	3	—	—	1	855	428	—	—	133
Sapelo	Austin Cary	4		*Persea borbonia*	2	1	1	—	—	—	—	95	—	—	—	—
Sapelo	Austin Cary	4		*Pinus palustris*	4	5	8	6	8	6	9	2,110	3,256	1,334	1,833	2,147
Sapelo	Austin Cary	4	T-Shrub	*Ilex glabra*	2	3	1	—	—	1	6					
Sapelo	Austin Cary	4		*Pinus elliottii*	2	1	—	—	1	—	—					
Sapelo	Austin Cary	4	S-Shrub	*Serenoa repens*	4	5	10	2	5	5	5					
Sapelo	Austin Cary	4		*Ilex glabra*	2	3	14	—	—	4	5					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Sapelo	Austin Cary	4		*Gaylussacia frondosa*	3	4	—	13	2	1	1					
Sapelo	Austin Cary	4		*Lyonia ferruginea*	3	1	—	—	—	4	—					
Sapelo	Austin Cary	4		*Ilex coriacea*	2	1	—	—	—	—	1					
Ocilla	Osceola	1	Tree	*Pinus elliottii*	2	5	6	4	10	4	3	2,577	1,134	2,534	1,755	1,698
Ocilla	Osceola	1		*Quercus laurifolia*	2	3	2	3	—	2	—	190	581	—	503	—
Ocilla	Osceola	1		*Juniperus silicicola*	3	3	—	1	—	2	1	—	50	—	134	154
Ocilla	Osceola	1		*Myrica cerifera*	3	3	—	3	—	2	2	—	217	—	139	115
Ocilla	Osceola	1		*Diospyros virginiana*	3	1	—	—	—	—	1	—	—	—	—	64
Ocilla	Osceola	1		*Quercus virginiana*	4	1	—	—	—	—	1	—	—	—	—	71
Ocilla	Osceola	1	T-Shrub	*Myrica cerifera*	3	4	1	—	2	1	2					
Ocilla	Osceola	1		*Quercus laurifolia*	2	1	1	—	—	—	—					
Ocilla	Osceola	1		*Juniperus silicicola*	3	1	—	—	—	4	—					
Ocilla	Osceola	1		*Gelsemium sempervirens*	3	1	—	—	—	1	—					
Ocilla	Osceola	1	S-Shrub	*Ilex glabra*	2	2	1	4	—	—	—					
Ocilla	Osceola	1		*Quercus laurifolia*	2	1	—	1	—	—	—					
Ocilla	Osceola	1		*Vitis rotundifolia*	3	1	—	—	—	1	—					
Ocilla	Osceola	1		*Gelsemium sempervirens*	3	2	—	—	—	1	1					
Ocilla	Osceola	1		*Itea virginica*	2	1	—	—	—	—	2					
Ocilla	Osceola	1		*Smilax bona-nox*	3	1	—	—	—	—	1					
Ocilla	Osceola	2	Tree	*Pinus elliottii*	2	5	3	4	4	2	3	879	2,595	4,376	1,046	1,627
Ocilla	Osceola	2		*Quercus laurifolia*	2	2	—	3	1	—	—	—	746	227	—	—
Ocilla	Osceola	2		*Quercus virginiana*	4	1	—	—	2	—	—	—	—	998	—	—
Ocilla	Osceola	2		*Prunus serotina*	4	1	—	—	—	—	1	—	—	—	—	241
Ocilla	Osceola	2	T-Shrub	*Ilex glabra*	2	3	—	1	—	6	2					
Ocilla	Osceola	2	S-Shrub	*Ilex glabra*	2	3	13	—	—	11	3					
Ocilla	Osceola	2		*Vaccinium myrsinites*	4	2	—	1	1	—	—					
Ocilla	Osceola	2		*Quercus laurifolia*	2	1	—	1	—	—	—					
Ocilla	Osceola	2		*Vaccinium/Gaylussacia* spp.	—	2	—	5	—	—	1					
Ocilla	Osceola	2		*Pinus elliottii*	2	1	—	—	1	—	—					
Ocilla	Osceola	2		*Sereno arepens*	4	1	—	—	—	—	1					
Ocilla	Osceola	2		*Quercus virginiana*	4	1	—	—	—	—	1					
Ocilla	Osceola	3	Tree	*Pinus elliottii*	2	4	2	1	1	—	1	1,665	491	661	—	491
Ocilla	Osceola	3		*Quercus nigra*	3	5	4	2	7	1	3	1,100	622	1,679	855	494
Ocilla	Osceola	3		*Pinus taeda*	3	2	—	1	—	1	—	—	1,320	—	1,194	—

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Ocilla	Osceola	3		*Quercus laurifolia*	2	2	—	1	1	—	—	—	71	78	—	—
Ocilla	Osceola	3		*Pinus palustris*	4	1	—	—	—	—	1	—	—	—	—	123
Ocilla	Osceola	3	T-Shrub	*Diospyros virginiana*	3	2	2	1	—	—	—					
Ocilla	Osceola	3		*Vaccinium elliottii*	3	1	—	—	2	—	—					
Ocilla	Osceola	3		*Quercus nigra*	3	2	—	—	—	1	2					
Ocilla	Osceola	3		*Lyonia fruticosa*	3	1	—	—	—	—	2					
Ocilla	Osceola	3	S-Shrub	*Quercus laurifolia*	2	2	5	—	—	1	—					
Ocilla	Osceola	3		*Vaccinium elliottii*	3	1	—	—	2	—	—					
Ocilla	Osceola	3		*Quercus nigra*	3	1	—	—	—	2	—					
Ocilla	Osceola	3		*Smilax bona-nox*	3	1	—	—	—	1	—					
Ocilla	Osceola	3		*Ilex glabra*	2	1	—	—	—	—	2					
Ocilla	Osceola	3		*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	—	3					
Ocilla	Osceola	4	Tree	*Pinus taeda*	3	5	1	4	2	1	2	398	3,832	1,456	1,963	2,527
Ocilla	Osceola	4		*Liquidamber styraciflua*	3	2	—	2	—	—	3	—	135	—	—	334
Ocilla	Osceola	4		*Quercus laurifolia*	2	2	—	—	—	3	3	—	—	—	216	3,229
Ocilla	Osceola	4		*Quercus nigra*	3	1	—	—	—	—	1	—	—	—	—	104
Ocilla	Osceola	4	T-Shrub	*Pinus taeda*	3	2	1	—	1	—	—					
Ocilla	Osceola	4		*Liquidamber styraciflua*	3	3	—	1	2	—	2					
Ocilla	Osceola	4		*Quercus nigra*	3	1	—	—	—	2	—					
Ocilla	Osceola	4	S-Shrub	*Ilex glabra*	2	5	1	9	2	3	4					
Ocilla	Osceola	4		*Gelsemium sempervirens*	3	2	1	2	—	—	—					
Ocilla	Osceola	4		*Vaccinium corymbosum*	2	1	1	—	—	—	—					
Ocilla	Osceola	4		*Quercus nigra*	3	2	—	1	—	—	2					
Ocilla	Osceola	4		*Liquidamber styraciflua*	3	2	—	—	4	—	2					
Albany	Osceola	1	Tree	*Pinus elliottii*	2	5	4	3	4	3	2	4,679	2,466	832	2,277	1,549
Albany	Osceola	1		*Quercus nigra*	3	1	3	—	—	—	—	379	—	—	—	—
Albany	Osceola	1		*Quercus laurifolia*	2	1	—	—	—	1	—	—	—	—	57	—
Albany	Osceola	1		*Prunus serotina*	4	1	—	—	—	—	1	—	—	—	—	50
Albany	Osceola	1		*Quercus virginiana*	4	2	1	—	—	—	1	283	—	—	—	64
Albany	Osceola	1	T-Shrub	*Ilex glabra*	2	2	2	—	—	—	1					
Albany	Osceola	1		*Lyonia fruticosa*	3	1	—	—	2	—	—					
Albany	Osceola	1	S-Shrub	*Ilex glabra*	2	4	16	—	6	20	12					
Albany	Osceola	1		*Vitis rotundifolia*	3	1	1	—	—	—	—					
Albany	Osceola	1		*Myrica cerifera*	3	1	—	—	2	—	—					
Albany	Osceola	1		*Vaccinium/Gaylussacia* spp.	—	2	9	—	—	1	—					
Albany	Osceola	1		*Rubus cuneifolius*	4	2	2	15	—	—	—					

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Albany	Osceola	1		*Pieris phillyreifolia*	2	1	1	—	—	—	—					
Albany	Osceola	1		*Smilax bona-nox*	3	2	1	—	1	—	—					
Albany	Osceola	1		*Asimina angustifolia*	5	1	—	1	—	—	—					
Albany	Osceola	1		*Lyonia ferruginea*	3	1	—	—	1	—	—					
Albany	Osceola	2	Tree	*Quercus laurifolia*	2	4	1	2	1	—	3	314	255	87	—	227
Albany	Osceola	2		*Quercus nigra*	3	1	1	—	—	—	—	133	—	—	—	—
Albany	Osceola	2		*Pinus elliottii*	2	3	—	3	1	2	—	—	507	57	564	—
Albany	Osceola	2		*Pinus palustris*	4	3	—	—	1	2	2	—	—	133	207	327
Albany	Osceola	2		*Pinus taeda*	3	2	—	—	2	1	—	—	—	732	201	—
Albany	Osceola	2		*Quercus virginiana*	4	1	—	—	1	—	—	—	—	113	—	—
Albany	Osceola	2	S-Shrub	*Quercus laurifolia*	2	1	2	—	—	—	—					
Albany	Osceola	2		*Asimina angustifolia*	5	1	—	—	—	—	2					
Albany	Osceola	3	Tree	*Pinus elliottii*	2	4	3	—	3	2	2	2,577	—	982	2,219	1,116
Albany	Osceola	3		*Quercus nigra*	3	2	—	2	—	2	—	—	209	—	332	—
Albany	Osceola	3		*Quercus virginiana*	4	1	—	1	—	—	—	—	491	—	—	—
Albany	Osceola	3		*Pinus taeda*	3	1	—	—	1	—	—	—	—	1,134	—	—
Albany	Osceola	3		*Quercus laurifolia*	2	3	—	—	3	2	3	—	—	1,901	139	377
Albany	Osceola	3	T-Shrub	*Quercus nigra*	3	2	2	1	—	—	—					
Albany	Osceola	3		*Smilax bona-nox*	3	2	—	—	15	—	1					
Albany	Osceola	3		*Quercus virginiana*	4	2	—	—	1	1	—					
Albany	Osceola	3		*Quercus laurifolia*	2	1	—	—	—	—	1					
Albany	Osceola	3	S-Shrub	*Asimina angustifolia*	5	2	2	—	1	—	—					
Albany	Osceola	3		*Quercus nigra*	3	4	3	2	—	1	1					
Albany	Osceola	3		*Hypericum tetrapetalum*	2	1	—	1	—	—	—					
Albany	Osceola	3		*Smilax bona-nox*	3	2	—	—	4	2	—					
Albany	Osceola	3		*Ilex glabra*	2	2	—	—	3	—	1					
Albany	Osceola	3		*Vaccinium/Gaylussacia* spp.	—	1	—	—	3	—	—					
Albany	Osceola	3		*Persea borbonia*	2	1	—	—	2	—	—					
Albany	Osceola	3		*Quercus virginiana*	4	1	—	—	1	—	—					
Albany	Osceola	3		*Acer rubrum*	3	1	—	—	1	—	—					
Albany	Osceola	4	Tree	*Pinus elliottii*	2	5	6	1	2	3	3	1,024	1,134	861	2,448	1,726
Albany	Osceola	4		*Pinus palustris*	4	2	—	2	3	—	—	—	481	1,757	—	—
Albany	Osceola	4		*Quercus laurifolia*	2	2	—	2	—	—	1	—	237	—	—	64
Albany	Osceola	4		*Quercus virginiana*	4	2	—	—	1	—	4	—	—	254	—	556

Appendix C. *Continued.*

Soil	Location	Site	Strata	Species	Index	Frequency	Density by plot 1	2	3	4	5	Basal area by plot 1	2	3	4	5
Albany	Osceola	4		*Quercus nigra*	3	1	—	—	—	—	1	—	—	—	—	214
Albany	Osceola	4	T-Shrub	*Pinus elliottii*	2	1	1	—	—	—	—					
Albany	Osceola	4		*Quercus virginiana*	4	1	—	1	—	—	—					
Albany	Osceola	4		*Quercus laurifolia*	2	1	—	—	—	1	—					
Albany	Osceola	4		*Quercus nigra*	3	2	—	—	—	3	1					
Albany	Osceola	4	S-Shrub	*Quercus virginiana*	4	2	—	1	2	—	—					
Albany	Osceola	4		*Smilax bona-nox*	3	1	—	1	—	—	—					
Albany	Osceola	4		*Vaccinium/Gaylussacia* spp.	—	1	—	12	—	—	—					
Albany	Osceola	4		*Quercus laurifolia*	2	1	—	—	1	—	—					
Albany	Osceola	4		*Pinus palustris*	4	1	—	—	2	—	—					
Albany	Osceola	4		*Quercus nigra*	3	2	—	—	—	1	1					

Appendix D. Species Composition for Herbaceous Stratum

Index refers to wetland indicator status, based on Reed (1988). Frequency is the number of subplots in which species appeared. Ten subplots, two subplots at each plot, were sampled at each area except for the Mascottee soil in Bradford Forest and the Sapelo soil in Austin Cary Forest where only one subplot was sampled in each plot for a total of five subplots in each area. Densities are the actual numbers sampled in each 4-m² sub-plot. Percent cover is the mid-point value from a cover class scale.

						Percent cover by plot and subplot									
						1		2		3		4		5	
Soil	Location	Site	Species	Index	Frequency	A	B	A	B	A	B	A	B	A	B
Croatan	Osceola	1	*Itea virginica*	2	1	2	—	—	—	—	—	—	—	—	—
Croatan	Osceola	1	*Persea borbonia*	2	1	2	—	—	—	—	—	—	—	—	—
Croatan	Osceola	1	*Nyssa sylvatica* var. *biflora*	3	4	2	—	—	—	—	2	15	—	—	2
Croatan	Osceola	1	*Lyonia lucida*	2	7	—	15	—	2	2	2	—	15	2	—
Croatan	Osceola	1	*Sphagnum* spp.	1	7	—	—	63	38	38	15	63	—	63	15
Croatan	Osceola	1	*Pieris phyllyreifolia*	2	1	—	—	2	—	—	—	—	—	—	—
Croatan	Osceola	1	*Clethra alnifolia*	2	2	—	—	—	—	—	2	2	—	—	—
Croatan	Osceola	2	*Magnolia virginiana*	2	1	—	—	—	—	—	—	—	—	2	—
Croatan	Osceola	2	*Sphagnum* spp.	—	6	85	63	—	63	—	—	15	—	15	2
Croatan	Osceola	2	*Nyssa sylvatica* var. *biflora*	3	3	—	2	—	2	—	—	—	—	—	2
Croatan	Osceola	2	*Acer rubrum*	3	8	—	2	2	2	2	2	2	2	2	—
Croatan	Osceola	2	*Itea virginica*	2	1	—	—	2	—	—	—	—	—	—	—
Croatan	Osceola	2	*Dulichium arundinaceum*	1	2	—	—	—	2	—	—	—	—	2	—
Croatan	Osceola	2	*Lyonia lucida*	2	3	—	—	—	2	2	—	2	—	—	—
Croatan	Osceola	2	*Juncus repens*	1	4	—	—	—	2	—	—	—	63	15	2
Croatan	Osceola	2	*Leucothoe racemosa*	2	1	—	—	—	—	—	2	—	—	—	—
Croatan	Osceola	2	*Saururus cernuus*	1	1	—	—	—	—	—	—	—	2	—	—
Croatan	Osceola	2	*Cephalanthus occidentalis*	1	1	—	—	—	—	—	—	—	2	—	—
Croatan	Osceola	3	*Smilax laurifolia*	2	1	—	—	—	—	—	2	—	—	—	—
Croatan	Osceola	3	*Utricularia* spp.	1	10	63	38	63	63	38	15	15	15	15	15
Croatan	Osceola	3	*Lemna* spp.	1	10	63	38	38	38	38	38	15	15	15	38
Croatan	Osceola	3	*Saururus cernuus*	1	4	—	—	—	15	—	—	—	38	15	2
Croatan	Osceola	3	*Acer rubrum*	3	1	—	—	—	—	2	—	—	—	—	—
Croatan	Osceola	3	*Magnolia virginiana*	2	1	—	—	—	—	—	2	—	—	—	—
Croatan	Osceola	3	*Lyonia lucida*	2	2	—	—	—	—	—	—	2	—	—	2

Appendix D. *Continued.*

						Percent cover by plot and subplot									
						1		2		3		4		5	
Soil	Location	Site	Species	Index	Frequency	A	B	A	B	A	B	A	B	A	B
Croatan	Osceola	4	*Smilax laurifolia*	2	1	—	2	—	—	—	—	—	—	—	—
Croatan	Osceola	4	*Woodwardia virginica*	1	4	38	2	15	—	—	—	—	—	2	—
Croatan	Osceola	4	*Sphagnum* spp.	—	8	85	98	38	—	63	15	85	85	85	—
Croatan	Osceola	4	*Polygonum hydropiperoides*	1	2	—	—	2	—	—	—	2	—	—	—
Croatan	Osceola	4	*Lyonia lucida*	2	1	—	—	—	15	—	—	—	—	—	—
Croatan	Osceola	4	*Clethra alnifolia*	2	1	—	—	—	2	—	—	—	—	—	—
Croatan	Osceola	4	*Leucothoe racemosa*	2	1	—	—	—	2	—	—	—	—	—	—
Croatan	Osceola	4	*Eriocaulon* sp.	—	1	—	—	—	—	—	15	—	—	—	—
Croatan	Osceola	4	*Nyssa sylvatica* var. *biflora*	3	1	—	—	—	—	—	—	—	—	—	2
Surrency	Osceola	1	*Lyonia lucida*	2	7	2	2	2	2	2	2	—	—	15	—
Surrency	Osceola	1	*Sphagnum* spp.	—	10	85	98	98	15	38	15	63	15	38	63
Surrency	Osceola	1	*Smilax laurifolia*	2	4	—	2	—	—	—	2	—	2	2	—
Surrency	Osceola	1	*Itea virginica*	2	3	—	2	—	—	2	2	—	—	—	—
Surrency	Osceola	1	*Lycopis rubellus*	1	3	—	2	—	—	—	—	2	2	—	—
Surrency	Osceola	1	*Nyssa sylvatica* var. *biflora*	3	2	—	—	2	—	2	—	—	—	—	—
Surrency	Osceola	1	*Dulichium arundinaceum*	1	1	—	—	—	—	2	—	—	—	—	—
Surrency	Osceola	1	*Myrica cerifera*	3	1	—	—	—	—	—	—	—	2	—	—
Surrency	Osceola	2	*Smilax laurifolia*	2	1	—	—	—	—	—	2	—	—	—	—
Surrency	Osceola	2	*Sphagnum* spp.	—	6	—	—	38	63	38	85	15	—	63	—
Surrency	Osceola	2	*Lyonia lucida*	2	3	2	—	—	—	2	—	—	—	—	15
Surrency	Osceola	2	*Itea virginica*	2	1	2	—	—	—	—	—	—	—	—	—
Surrency	Osceola	2	*Leucothoe racemosa*	2	1	—	2	—	—	—	—	—	—	—	—
Surrency	Osceola	2	*Pieris phyllyreifolia*	2	1	—	2	—	—	—	—	—	—	—	—
Surrency	Osceola	2	*Ilex myrtifolia*	2	1	—	—	2	—	—	—	—	—	—	—
Surrency	Osceola	2	*Nyssa sylvatica* var. *biflora*	3	5	—	—	2	2	2	—	2	—	—	2
Surrency	Osceola	2	*Clethra alnifolia*	2	1	—	—	—	—	—	—	—	—	—	2
Surrency	Osceola	3	*Sphagnum* spp.	—	5	—	—	63	63	98	—	85	85	—	—
Surrency	Osceola	3	*Acer rubrum*	3	1	2	—	—	—	—	—	—	—	—	—
Surrency	Osceola	3	*Toxicodendron radicans*	3	2	2	—	—	—	—	—	2	—	—	—
Surrency	Osceola	3	*Ilex cassine*	2	1	2	—	—	—	—	—	—	—	—	—
Surrency	Osceola	3	*Lyonia lucida*	2	2	—	2	—	—	—	—	—	—	2	—
Surrency	Osceola	3	*Dulichium arundinaceum*	1	1	—	—	2	—	—	—	—	—	—	—
Surrency	Osceola	3	*Juncus repens*	1	1	—	—	—	—	—	—	2	—	—	—

Appendix D. *Continued.*

						Percent cover by plot and subplot									
						1		2		3		4		5	
Soil	Location	Site	Species	Index	Frequency	A	B	A	B	A	B	A	B	A	B
Surrency	Osceola	4	*Smilax laurifolia*	1	4	2	2	—	—	—	2	2	—	—	—
Surrency	Osceola	4	*Serenoa repens*	4	3	2	—	—	—	—	—	2	—	—	2
Surrency	Osceola	4	*Sphagnum* spp.	—	6	2	2	63	2	85	2	—	—	—	—
Surrency	Osceola	4	*Juncus repens*	1	1	—	—	—	—	—	—	—	—	—	2
Surrency	Osceola	4	*Dulichium arundinaceum*	1	1	—	2	—	—	—	—	—	—	—	—
Surrency	Osceola	4	*Ludwigia pilosa*	1	2	—	—	2	2	—	—	—	—	—	—
Surrency	Osceola	4	*Clethra alnifolia*	2	2	—	—	15	—	—	—	—	2	—	—
Surrency	Osceola	4	*Lyonia lucida*	2	5	—	—	15	—	—	—	—	2	—	—
Surrency	Osceola	4	*Xyris* sp.	—	2	—	—	—	—	15	2	—	—	—	—
Surrency	Osceola	4	*Pieris phyllyreifolia*	2	3	—	—	2	—	—	—	—	2	2	—
Surrency	Osceola	4	*Polygonum hydropiperoides*	1	1	—	—	—	—	—	—	—	2	—	—
Mascotte	Osceola	1	*Ilex glabra*	2	9	15	15	2	15	—	2	2	15	15	2
Mascotte	Osceola	1	*Gaylussacia tomentosa*	5	4	—	—	15	—	2	—	2	—	—	15
Mascotte	Osceola	1	*Serenoa repens*	4	1	—	—	—	2	—	—	—	—	—	—
Mascotte	Osceola	1	*Vaccinium/Gaylussacia* spp.	—	3	—	—	—	—	—	2	—	2	2	—
Mascotte	Osceola	2	*Ilex glabra*	2	8	15	15	2	—	2	—	2	2	2	2
Mascotte	Osceola	2	*Vaccinium myrsinites*	4	5	15	—	2	2	—	—	—	2	—	15
Mascotte	Osceola	2	*Myrica cerifera*	3	2	2	—	—	—	—	—	—	—	—	15
Mascotte	Osceola	2	*Aristida stricta*	3	6	38	—	38	—	—	15	2	2	—	15
Mascotte	Osceola	2	*Paspalum* spp.	—	3	2	—	—	—	—	2	—	—	—	2
Mascotte	Osceola	2	*Vaccinium/Gaylussacia* spp.	—	8	2	—	2	2	2	2	—	2	2	15
Mascotte	Osceola	2	*Serenoa repens*	4	2	—	—	—	2	—	2	—	—	—	—
Mascotte	Osceola	2	*Andropogon glomeratus*	2	1	—	—	—	—	—	—	—	—	2	—
Mascotte	Osceola	2	*Paspalum* spp.	—	2	—	2	—	—	—	—	—	2	—	—
Mascotte	Osceola	3	*Toxicodendron radicans*	3	1	2	—	—	—	—	—	—	—	—	—
Mascotte	Osceola	3	*Ilex glabra*	2	8	2	15	2	—	2	2	—	2	2	15
Mascotte	Osceola	3	*Ilex cassine*	2	1	2	—	—	—	—	—	—	—	—	—
Mascotte	Osceola	3	*Aristida stricta*	3	3	—	63	—	15	—	—	15	—	—	—
Mascotte	Osceola	3	*Serenoa repens*	4	5	—	—	2	2	2	—	2	—	—	2
Mascotte	Osceola	3	*Lyonia lucida*	2	3	—	—	2	—	—	—	2	—	2	—
Mascotte	Osceola	3	*Vaccinium/Gaylussacia* spp.	—	5	—	—	38	2	15	15	—	—	2	—
Mascotte	Osceola	3	*Acer rubrum*	3	1	—	—	—	2	—	—	—	—	—	—
Mascotte	Osceola	3	*Persea borbonia*	2	1	—	—	—	2	—	—	—	—	—	—
Mascotte	Osceola	3	*Vaccinium myrsinites*	4	1	—	—	—	—	—	15	—	—	—	—

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot									
						1		2		3		4		5	
						A	B	A	B	A	B	A	B	A	B
Mascotte	Osceola	4	*Paspalum* spp.	—	2	2	—	—	—	—	2	—	—	—	—
Mascotte	Osceola	4	*Serenoa repens*	4	5	2	—	15	2	—	—	—	2	2	—
Mascotte	Osceola	4	*Vaccinium myrsinites*	4	6	—	15	—	—	15	15	2	—	15	2
Mascotte	Osceola	4	*Vaccinium*/*Gaylussacia* spp.	—	6	38	2	2	2	15	2	—	—	—	—
Mascotte	Osceola	4	*Lyonia ferruginea*	3	4	—	2	—	—	2	—	—	—	2	2
Mascotte	Osceola	4	*Pterocaulon pycnostachyum*	3	1	—	—	2	—	—	—	—	—	—	—
Mascotte	Osceola	4	*Andropogon glomeratus*	2	3	—	—	—	—	—	15	—	38	63	—
Mascotte	Osceola	4	*Ilex glabra*	2	4	—	—	—	—	—	2	2	—	2	2
Mascotte	Osceola	4	*Aristida stricta*	3	1	—	—	—	—	—	—	—	—	38	—
Mascotte	Bradford	1	*Ilex glabra*	2	5	15		15		2		2		2	
Mascotte	Bradford	1	*Vaccinium myrsinites*	4	4	2		—		15		2		2	
Mascotte	Bradford	1	*Aristida stricta*	3	2	63		—		15		—		—	
Mascotte	Bradford	1	*Serenoa repens*	4	1	2		—		—		—		—	
Mascotte	Bradford	1	*Castania pumila*	5	1	—		2		2		—		—	
Mascotte	Bradford	1	*Lyonia ferruginea*	3	2	—		2		2		—		—	
Mascotte	Bradford	1	*Gaylussacia frondosa*	3	2	—		—		—		2		15	
Mascotte	Bradford	2	*Vaccinium myrsinites*	4	2	15		—		—		—		2	
Mascotte	Bradford	2	*Ilex glabra*	2	2	—		—		—		2		2	
Mascotte	Bradford	2	*Paspalum* spp.	—	1	2		—		—		—		—	
Mascotte	Bradford	2	*Lyonia ferruginea*	3	1	38		—		—		—		—	
Mascotte	Bradford	2	*Aristida stricta*	3	2	38		—		—		—		2	
Mascotte	Bradford	2	*Gaylussacia frondosa*	3	3	2		—		—		2		15	
Mascotte	Bradford	2	*Gelsemium sempervirens*	3	1	—		2		—		—		—	
Mascotte	Bradford	2	*Lyonia lucida*	2	1	—		2		—		—		—	
Mascotte	Bradford	2	*Serenoa repens*	4	1	—		—		2		—		—	
Mascotte	Bradford	3	*Ilex glabra*	2	4	2		—		2		2		2	
Mascotte	Bradford	3	*Ilex coriacea*	2	2	—		2		—		2		—	
Mascotte	Bradford	3	*Lyonia lucida*	2	3	—		—		2		2		2	
Mascotte	Bradford	3	*Rhododendron canescens*	2	1	—		—		—		2		—	
Mascotte	Bradford	4	*Ilex glabra*	2	5	2		2		2		2		2	
Mascotte	Bradford	4	*Vaccinium myrsinites*	4	2	2		—		—		—		15	
Mascotte	Bradford	4	*Serenoa repens*	4	1	—		—		—		2		—	

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot: 1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Sapelo	Osceola	1	*Eupatorium* sp.	—	1	—	—	—	—	—	2	—	—	—	—
Sapelo	Osceola	1	*Lyonia lucida*	2	1	—	—	—	2	—	—	—	—	—	—
Sapelo	Osceola	1	*Lyonia fruticosa*	3	4	2	—	—	2	—	—	—	2	—	2
Sapelo	Osceola	1	*Vaccinium myrsinites*	4	8	15	38	15	—	63	—	63	15	15	15
Sapelo	Osceola	1	*Aristida stricta*	3	8	37	15	15	2	—	2	2	—	15	38
Sapelo	Osceola	1	*Serenoa repens*	4	3	2	—	—	2	—	—	—	2	—	—
Sapelo	Osceola	1	*Quercus pumila*	5	7	—	2	—	15	2	2	2	—	2	2
Sapelo	Osceola	1	*Pityopsis graminifolia*	5	3	—	2	—	2	2	—	—	—	—	—
Sapelo	Osceola	1	*Ilex glabra*	2	1	—	—	2	—	—	—	—	—	—	15
Sapelo	Osceola	1	*Vaccinium/Gaylussacia* spp.	—	3	—	—	2	—	—	2	—	—	—	2
Sapelo	Osceola	1	*Paspalum* spp.	—	4	—	—	—	—	2	—	—	2	2	2
Sapelo	Osceola	1	*Hypericum tetrapetalum*	2	3	—	—	—	—	2	2	—	—	2	—
Sapelo	Osceola	1	*Andropogon glomeratus*	2	1	—	—	—	—	—	2	—	—	—	—
Sapelo	Osceola	1	*Lyonia ferruginea*	3	2	—	—	—	—	—	—	2	—	—	2
Sapelo	Osceola	1	*Pterocaulon pycnostachyum*	3	1	—	—	—	—	—	—	—	2	—	—
Sapelo	Osceola	1	*Ilex coriacea*	2	1	—	—	15	—	—	—	—	2	—	—
Sapelo	Osceola	2	*Centella asiatica*	2	1	—	—	—	—	—	2	—	—	—	—
Sapelo	Osceola	2	*Vaccinium myrsinites*	4	6	2	—	—	15	38	—	2	15	—	15
Sapelo	Osceola	2	*Quercus pumila*	5	4	2	—	—	—	—	—	2	2	—	15
Sapelo	Osceola	2	*Andropogon glomeratus*	2	3	15	—	—	2	—	15	—	—	—	—
Sapelo	Osceola	2	*Paspalum* spp.	—	7	2	15	2	2	—	2	2	2	—	—
Sapelo	Osceola	2	*Aristida stricta*	3	7	15	15	15	—	15	—	38	38	—	2
Sapelo	Osceola	2	*Pityopsis graminifolia*	5	1	2	—	—	—	—	—	—	—	—	—
Sapelo	Osceola	2	*Ilex glabra*	2	5	—	2	15	15	2	—	—	—	2	—
Sapelo	Osceola	2	*Serenoa repens*	4	1	—	2	—	—	—	—	—	—	—	—
Sapelo	Osceola	2	*Centella asiatica*	2	1	—	—	15	—	—	—	—	—	—	—
Sapelo	Osceola	2	*Vaccinium/Gaylussacia* spp.	—	5	—	—	2	2	—	—	2	2	—	38
Sapelo	Osceola	2	*Lyonia fruticosa*	3	3	—	—	—	2	2	—	2	—	—	—
Sapelo	Osceola	2	*Gaylussacia dumosa*	3	1	—	—	—	—	2	—	—	—	—	—
Sapelo	Osceola	2	*Andropogon capillipes*	4	1	—	—	—	—	—	—	—	—	—	2
Sapelo	Osceola	3	*Hypericum tetrapetalum*	2	1	—	—	—	—	—	—	—	—	—	2
Sapelo	Osceola	3	*Ilex glabra*	2	8	15	15	15	2	—	2	2	2	—	2
Sapelo	Osceola	3	*Sphagnum* spp.	—	1	2	—	—	—	—	—	—	—	—	—
Sapelo	Osceola	3	*Lyonia lucida*	2	1	—	38	—	—	—	—	—	—	—	—

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot 1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Sapelo	Osceola	3	*Gelsemium sempervirens*	3	5	—	—	15	2	2	—	—	—	15	15
Sapelo	Osceola	3	*Vaccinium myrsinites*	4	4	—	—	2	2	—	—	—	—	2	15
Sapelo	Osceola	3	*Lyonia fruticosa*	3	2	—	—	2	—	—	—	—	—	—	2
Sapelo	Osceola	3	*Serenoa repens*	4	3	—	—	2	2	2	—	—	—	—	—
Sapelo	Osceola	3	*Quercus pumila*	5	5	—	—	—	2	2	2	—	—	2	2
Sapelo	Osceola	3	*Aristida stricta*	3	1	—	—	—	—	—	38	—	—	—	—
Sapelo	Osceola	3	*Vaccinium/Gaylussacia* spp.	—	3	—	—	—	—	2	—	15	—	2	—
Sapelo	Osceola	3	*Andropogon glomeratus*	2	1	—	—	—	—	—	2	—	—	—	—
Sapelo	Osceola	3	*Kalmia hirsuta*	2	1	—	—	—	—	—	2	—	—	—	—
Sapelo	Osceola	3	*Smilax glauca*	3	1	—	—	—	—	—	—	2	—	—	—
Sapelo	Osceola	3	*Gaylussacia dumosa*	3	1	—	—	—	—	—	—	2	—	—	—
Sapelo	Osceola	3	*Pterocaulon pycnostachyum*	3	1	—	—	—	—	—	—	—	—	—	2
Sapelo	Osceola	4	*Vaccinium myrsinites*	4	7	2	2	38	2	—	—	2	—	2	15
Sapelo	Osceola	4	*Ilex glabra*	2	9	2	2	15	38	15	2	2	2	2	—
Sapelo	Osceola	4	*Aristida stricta*	3	8	15	15	15	—	—	15	2	2	2	2
Sapelo	Osceola	4	*Lyonia fruticosa*	3	4	2	2	—	—	—	—	—	—	2	2
Sapelo	Osceola	4	*Serenoa repens*	4	4	2	—	—	—	—	15	—	—	2	2
Sapelo	Osceola	4	*Gaylussacia dumosa*	3	3	2	—	—	—	—	—	—	2	—	2
Sapelo	Osceola	4	*Sorghastrum secundum*	4	1	—	15	—	—	—	—	—	—	—	—
Sapelo	Osceola	4	*Smilax auriculata*	4	1	—	2	—	—	—	—	—	—	—	—
Sapelo	Osceola	4	*Quercus laurifolia*	2	2	—	—	2	2	—	—	—	—	—	—
Sapelo	Osceola	4	*Kalmia hirsuta*	2	1	—	—	—	2	—	—	—	—	—	—
Sapelo	Osceola	4	*Quercus pumila*	5	5	—	—	—	—	2	—	2	2	2	2
Sapelo	Osceola	4	*Vaccinium/Gaylussacia* spp.	—	5	—	—	—	—	15	—	2	2	2	2
Sapelo	Osceola	4	*Paspalum* spp.	—	1	—	—	—	—	—	—	—	—	2	—
Sapelo	Austin Cary	1	*Lyonia lucida*	2	3	2		—		—		2		2	
Sapelo	Austin Cary	1	*Serenoa repens*	4	2	2		—		—		—		2	
Sapelo	Austin Cary	1	*Persea borbonia*	2	1	—		2		—		—		—	
Sapelo	Austin Cary	1	*Andropogon glomeratus*	2	1	—		—		2		—		—	
Sapelo	Austin Cary	1	*Aristida stricta*	3	1	—		—		2		—		—	
Sapelo	Austin Cary	1	*Paspalum* spp.	—	1	—		—		2		—		—	
Sapelo	Austin Cary	1	*Quercus pumila*	5	1	—		—		2		—		—	
Sapelo	Austin Cary	1	*Vaccinium myrsinites*	4	2	—		—		2		2		—	
Sapelo	Austin Cary	1	*Paspalum* spp.	—	1	—		—		2		—		—	

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot									
						1		2		3		4		5	
						A	B	A	B	A	B	A	B	A	B
Sapelo	Austin Cary	1	*Rubus cuneifolius*	4	1	—		—		2		—		—	
Sapelo	Austin Cary	1	*Gaylussacia frondosa*	3	1	—		—		—		2		—	
Sapelo	Austin Cary	1	*Galactia elliottii*	4	1	—		—		—		2		—	
Sapelo	Austin Cary	1	*Kalmia hirsuta*	2	1	—		—		—		2		—	
Sapelo	Austin Cary	2	*Gaylussacia frondosa*	3	1	2		—		—		—		—	
Sapelo	Austin Cary	2	*Quercus pumila*	5	2	2		2		—		—		—	
Sapelo	Austin Cary	2	*Vaccinium corymbosum*	2	1	2		—		—		—		—	
Sapelo	Austin Cary	2	*Paspalum* spp.	—	1	2		—		—		—		—	
Sapelo	Austin Cary	2	*Lyonia lucida*	2	4	2		2		2		—		2	
Sapelo	Austin Cary	2	*Ilex glabra*	2	3	—		2		—		2		2	
Sapelo	Austin Cary	2	*Vaccinium myrsinites*	4	1	—		2		—		—		—	
Sapelo	Austin Cary	3	*Serenoa repens*	4	1	2		—		—		—		—	
Sapelo	Austin Cary	3	*Lyonia ferruginea*	3	3	—		2		2		2		—	
Sapelo	Austin Cary	3	*Smilax bona-nox*	3	1	—		2		—		—		—	
Sapelo	Austin Cary	3	*Aristida stricta*	3	1	—		2		—		—		—	
Sapelo	Austin Cary	3	*Pteridium aquilinum*	4	1	—		2		—		—		—	
Sapelo	Austin Cary	3	*Gaylussacia frondosa*	3	1	—		—		2		—		—	
Sapelo	Austin Cary	3	*Ilex glabra*	2	2	—		—		2		—		2	
Sapelo	Austin Cary	3	*Andropogon glomeratus*	2	1	—		—		—		2		—	
Sapelo	Austin Cary	3	*Vitis rotundifolia*	3	1	—		—		—		2		—	
Sapelo	Austin Cary	3	*Smilax glauca*	3	1	—		—		—		2		—	
Sapelo	Austin Cary	4	*Smilax laurifolia*	2	1	2		—		—		—		—	
Sapelo	Austin Cary	4	*Lyonia ferruginea*	3	1	2		—		—		—		—	
Sapelo	Austin Cary	4	*Cassia fasiculata*	3	4	2		2		15		—		2	
Sapelo	Austin Cary	4	*Ilex glabra*	2	2	2		—		—		2		—	
Sapelo	Austin Cary	4	*Serenoa repens*	4	3	—		2		2		2		—	
Sapelo	Austin Cary	4	*Pinus elliottii*	2	1	—		—		2		—		—	
Sapelo	Austin Cary	4	*Aristida stricta*	3	1	—		—		2		—		—	
Sapelo	Austin Cary	4	*Ilex coriacea*	2	1	—		—		—		—		2	
Sapelo	Austin Cary	4	*Gordonia lasianthus*	2	1	—		—		—		—		2	
Ocilla	Osceola	1	*Vitis rotundifolia*	3	1	2	—	—	—	—	—	—	—	—	—
Ocilla	Osceola	1	*Smilax auriculata*	4	3	2	—	2	—	—	—	—	—	—	2

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot									
						1		2		3		4		5	
						A	B	A	B	A	B	A	B	A	B
Ocilla	Osceola	1	*Ilex glabra*	2	3	2	—	—	—	—	2	—	—	2	—
Ocilla	Osceola	1	*Smilax bona-nox*	3	2	—	—	—	2	—	2	—	—	—	—
Ocilla	Osceola	1	*Myrica cerifera*	3	3	—	—	—	15	2	—	—	—	2	—
Ocilla	Osceola	1	*Gelsemium sempervirens*	3	6	—	—	—	2	2	2	—	2	2	2
Ocilla	Osceola	1	*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	—	15	—	—	—	—	—
Ocilla	Osceola	1	*Vaccinium myrsinites*	4	1	—	—	—	—	—	2	—	—	—	—
Ocilla	Osceola	1	*Quercus nigra*	3	1	—	—	—	—	—	—	2	—	—	—
Ocilla	Osceola	2	*Ilex glabra*	2	6	2	15	—	2	2	—	—	2	—	2
Ocilla	Osceola	2	*Pityopsis graminifolia*	5	2	2	—	—	—	—	—	—	—	2	—
Ocilla	Osceola	2	*Paspalum* spp.	—	6	—	2	—	—	2	—	2	2	2	2
Ocilla	Osceola	2	*Hypericum fasciculatum*	2	2	—	15	—	—	—	15	—	—	—	—
Ocilla	Osceola	2	*Elephantopus elatus*	5	1	—	2	—	—	—	—	—	—	—	—
Ocilla	Osceola	2	*Gelsemium sempervirens*	3	4	—	—	38	—	2	2	—	—	—	2
Ocilla	Osceola	2	*Vaccinium myrsinites*	4	3	—	—	2	—	—	—	2	15	—	—
Ocilla	Osceola	2	*Andropogon virginicus*	4	6	—	—	15	—	2	—	15	2	2	2
Ocilla	Osceola	2	*Quercus nigra*	3	1	—	—	—	2	—	—	—	—	—	—
Ocilla	Osceola	2	*Serenoa repens*	4	1	—	—	—	2	—	—	—	—	—	—
Ocilla	Osceola	2	*Quercus virginiana*	4	2	—	—	—	—	2	—	—	—	2	—
Ocilla	Osceola	2	*Vaccinium/Gaylussacia* spp.	—	2	—	—	—	—	2	2	—	—	—	—
Ocilla	Osceola	2	*Aristida stricta*	3	1	—	—	—	—	—	—	15	—	—	—
Ocilla	Osceola	2	*Castania pumila*	5	1	—	—	—	—	—	—	—	15	—	—
Ocilla	Osceola	2	*Smilax auriculata*	4	1	—	—	—	—	—	—	—	2	—	—
Ocilla	Osceola	3	*Smilax auriculata*	4	4	38	—	—	—	—	2	2	—	2	—
Ocilla	Osceola	3	*Quercus laurifolia*	2	4	15	2	2	—	2	—	—	—	—	—
Ocilla	Osceola	3	*Gelsemium sempervirens*	3	3	2	—	—	—	—	15	—	—	—	15
Ocilla	Osceola	3	*Quercus nigra*	3	4	—	—	2	2	—	2	2	—	—	—
Ocilla	Osceola	3	*Vaccinium elliottii*	3	3	—	—	—	2	2	15	—	—	—	—
Ocilla	Osceola	3	*Ilex opaca*	3	1	—	—	—	—	—	—	2	—	—	—
Ocilla	Osceola	3	*Vitis rotundifolia*	3	1	—	—	—	—	—	—	—	2	—	—
Ocilla	Osceola	3	*Ilex glabra*	2	1	—	—	—	—	—	—	—	—	2	—
Ocilla	Osceola	3	*Diospyros virginiana*	3	1	—	—	—	—	—	—	—	—	2	—
Ocilla	Osceola	3	*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	—	—	—	—	—	15	—
Ocilla	Osceola	4	*Quercus nigra*	3	3	2	—	—	—	—	—	—	2	—	15
Ocilla	Osceola	4	*Gelsemium sempervirens*	3	9	38	63	38	2	38	15	15	15	2	—
Ocilla	Osceola	4	*Ilex glabra*	2	2	15	—	—	—	—	—	—	—	—	2
Ocilla	Osceola	4	*Paspalum* spp.	—	4	—	2	2	—	2	—	2	—	—	—

Appendix D. *Continued.*

						Percent cover by plot and subplot									
						1		2		3		4		5	
Soil	Location	Site	Species	Index	Frequency	A	B	A	B	A	B	A	B	A	B
Ocilla	Osceola	4	*Liquidambar styraciflua*	3	3	—	—	2	2	2	—	—	—	—	—
Ocilla	Osceola	4	*Quercus laurifolia*	2	4	—	—	—	15	2	2	—	—	—	2
Ocilla	Osceola	4	*Vaccinium/Gaylussacia* spp.	—	1	—	—	2	—	—	—	—	—	—	—
Ocilla	Osceola	4	*Smilax bona-nox*	3	4	—	—	—	—	2	2	—	2	—	2
Ocilla	Osceola	4	*Myrica cerifera*	3	3	—	—	—	—	—	2	2	—	2	—
Ocilla	Osceola	4	*Ilex opaca*	3	1	—	—	—	—	—	2	—	—	—	—
Ocilla	Osceola	4	*Kalmia hirsuta*	2	1	—	—	—	—	—	—	—	15	—	—
Albany	Osceola	1	*Smilax glauca*	3	1	—	—	—	—	—	—	—	—	—	2
Albany	Osceola	1	*Pterocaulon pycnostachyum*	3	2	—	—	—	—	—	—	2	2	—	—
Albany	Osceola	1	*Andropogon glomeratus*	2	1	—	—	—	—	—	—	—	—	2	—
Albany	Osceola	1	*Vaccinium myrsinites*	4	4	2	15	—	—	15	—	—	—	—	15
Albany	Osceola	1	*Paspalum setaceum*	3	7	—	15	15	15	2	2	2	2	—	—
Albany	Osceola	1	*Vaccinium/Gaylussacia* spp.	—	7	38	15	15	—	15	15	—	—	15	15
Albany	Osceola	1	*Paspalum* spp.	—	6	—	—	38	15	2	2	15	—	2	—
Albany	Osceola	1	*Elephantopus elatus*	5	1	—	—	—	—	2	—	—	—	—	—
Albany	Osceola	1	*Ilex glabra*	2	3	—	—	—	—	2	2	—	—	—	2
Albany	Osceola	1	*Smilax bona-nox*	3	1	—	—	—	—	—	15	—	—	—	—
Albany	Osceola	1	*Pteridium aquilinum*	4	1	—	—	—	—	—	—	—	—	2	—
Albany	Osceola	1	*Xyris* sp.	—	1	—	—	—	—	—	2	—	—	—	—
Albany	Osceola	1	*Serenoa repens*	4	2	—	—	—	—	—	—	15	—	—	2
Albany	Osceola	1	*Rhynchosis* spp.	—	1	—	—	—	—	—	—	15	—	—	—
Albany	Osceola	1	*Crotonopsis linearis*	5	1	—	—	—	—	—	—	2	—	—	—
Albany	Osceola	1	*Rubus cuneifolius*	4	2	—	—	—	—	—	—	—	2	2	—
Albany	Osceola	1	*Quercus laurifolia*	2	1	—	—	—	—	—	—	—	2	—	—
Albany	Osceola	2	*Crotonopsis linearis*	5	6	2	—	15	—	—	15	15	15	2	—
Albany	Osceola	2	*Paspalum* spp.	3	9	38	2	2	2	—	15	2	2	15	2
Albany	Osceola	2	*Vaccinium myrsinites*	4	5	—	38	—	—	15	38	—	2	2	—
Albany	Osceola	2	*Galactia elliottii*	4	1	—	15	—	—	—	—	—	—	—	—
Albany	Osceola	2	*Serenoa repens*	4	1	—	—	2	—	—	—	—	—	—	—
Albany	Osceola	2	*Pityopsis graminifolia*	5	4	—	—	2	—	2	2	15	—	—	—
Albany	Osceola	2	*Gelsemium sempervirens*	3	1	—	—	—	15	—	—	—	—	—	—
Albany	Osceola	2	*Lonicera sempervirens*	3	4	—	—	—	15	—	2	—	—	2	15
Albany	Osceola	2	*Vaccinium/Gaylussacia* spp.	—	1	—	—	—	—	2	—	—	—	—	—
Albany	Osceola	2	*Andropogon glomeratus*	2	1	—	—	—	—	—	—	—	15	—	—

Appendix D. *Continued.*

Soil	Location	Site	Species	Index	Frequency	Percent cover by plot and subplot: 1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Albany	Osceola	2	*Asimina angustifolia*	5	1	—	—	—	—	—	—	—	—	—	2
Albany	Osceola	2	*Eryngium aromaticum*	2	1	—	—	—	—	—	—	—	—	—	15
Albany	Osceola	2	*Spiranthes tortilis*	4	2	2	—	—	2	—	—	—	—	—	—
Albany	Osceola	3	*Smilax bona-nox*	3	5	2	2	—	—	38	2	—	—	2	—
Albany	Osceola	3	*Panicum anceps*	3	7	2	38	15	2	—	—	2	2	—	2
Albany	Osceola	3	*Tragia urens*	5	1	2	—	—	—	—	—	—	—	—	—
Albany	Osceola	3	*Gelsemium sempervirens*	3	4	2	—	2	—	—	—	15	15	—	—
Albany	Osceola	3	*Asimina angustifolia*	5	1	2	—	—	—	—	—	—	—	—	—
Albany	Osceola	3	*Quercus nigra*	3	1	2	2	—	—	—	—	—	—	—	—
Albany	Osceola	3	*Vaccinium/Gaylussacia* spp.	—	2	2	—	—	—	—	—	—	15	—	—
Albany	Osceola	3	*Vitis rotundifolia*	3	1	—	2	—	—	—	—	—	—	—	—
Albany	Osceola	3	*Rhynchosis* spp.	—	1	—	2	—	—	—	—	—	—	—	—
Albany	Osceola	3	*Andropogon glomeratus*	2	1	—	—	—	2	—	—	—	—	—	—
Albany	Osceola	3	*Ilex glabra*	2	2	—	—	—	2	—	2	—	—	—	—
Albany	Osceola	3	*Quercus virginiana*	4	2	—	—	—	—	—	15	—	—	—	38
Albany	Osceola	4	*Gelsemium sempervirens*	3	2	15	15	—	—	—	—	—	—	—	—
Albany	Osceola	4	*Eupatorium capillifolium*	4	6	15	15	15	15	2	—	—	2	—	—
Albany	Osceola	4	*Pityopsis graminifolia*	5	5	2	—	2	2	—	—	—	2	2	—
Albany	Osceola	4	*Panicum anceps*	3	7	15	—	—	2	2	2	2	2	15	—
Albany	Osceola	4	*Vaccinium/Gaylussacia* spp.	—	1	—	63	—	—	—	—	—	—	—	—
Albany	Osceola	4	*Eryngium aromaticum*	2	1	—	—	—	2	—	—	—	—	—	—
Albany	Osceola	4	*Andropogon glomeratus*	2	4	—	—	—	—	15	15	15	15	—	—
Albany	Osceola	4	*Aristida condensata*	5	2	—	—	—	—	—	2	—	15	—	—
Albany	Osceola	4	*Crotonopsis linearis*	5	1	—	—	—	—	—	2	—	—	—	—
Albany	Osceola	4	*Smilax bona-nox*	3	2	—	—	2	—	—	—	15	—	—	—
Albany	Osceola	4	*Myrica cerifera*	3	1	—	—	—	—	—	—	2	—	—	—
Albany	Osceola	4	*Ilex glabra*	2	1	—	—	—	—	—	—	2	—	—	—
Albany	Osceola	4	*Paspalum setaceum*	3	1	—	—	—	—	—	—	—	—	2	—
Albany	Osceola	4	*Vaccinium myrsinites*	4	1	—	—	—	—	—	—	—	—	—	15
Albany	Osceola	4	*Quercus laurifolia*	2	1	—	—	—	—	—	—	—	—	—	2
Albany	Osceola	4	*Cassia fasciculata*	4	1	2	—	—	—	—	—	—	—	—	—

Appendix E. Vegetation List From Study Sites; Wetland Indicator Status Based On Reed (1988)

Species	Wetland indicator status
Acer rubrum	FAC[a]
Andropogon glomeratus	FACW[b]
Andropogon capillipes (Andropogon virginicus var. *glauca)*	FACU[c]
Aristida condensata	NL[d](UPL)
Aristida stricta	FAC
Asimina angustifolia	NL(UPL)
Aster tortifolius	NL(UPL)
Befaria racemosa	FAC
Cassia fasciculata	FACU
Castania pumila	NL(UPL)
Centella asiatica	FACW
Cephalanthus occidentalis	OBL[c]
Clethra alnifolia	FACW
Croton argyranthemus	NL(UPL)
Crotonopsis linearis	NL(UPL)
Diospyros virginiana	FAC
Dulichium arundinaceum	OBL
Elephantopus elatus	NL(UPL)
Eriocaulon sp.	NI[f]
Eryngium aromaticum	FACW
Eupatorium capillifolium	FACU
Eupatorium sp.	NI
Galactia elliottii	FACU
Galactia regularis	NL(UPL)
Gaylussacia dumosa	FAC
Gaylussacia frondosa	FAC
Gaylussacia tomentosa	NL(UPL)
Gelsemium sempervirens	FAC
Gordonia lasianthus	FACW
Helianthemum corymbosum	NL(UPL)
Hypericum fasciculatum	FACW
Hypericum tetrapetalum	FACW
Ilex cassine	FACW
Ilex coriacea	FACW
Ilex glabra	FACW
Ilex myrtifolia	FACW
Ilex opaca	FAC
Itea virginica	FACW
Juncus repens	OBL
Juncus scirpoides	FACW
Juniperus silicicola	FAC
Kalmia hirsuta	FACW
Lemna spp.	OBL
Leucothoe racemosa	FACW
Liquidambar styraciflua	FAC
Lonicera sempervirens	FAC
Ludwigia pilosa	OBL
Ludwigia repens	OBL
Lycopus rubellus	OBL
Magnolia virginiana	FACW
Myrica cerifera	FAC
Nyssa sylvatica var. *biflora*	OBL
Panicum anceps	FAC
Panicum sp.	NI
Paspalum setaceum	FAC
Paspalum sp.	NI
Persea borbonia	FACW
Pieris phyllyreifolia	FACW
Pinus elliottii	FACW
Pinus palustris	FACU
Pinus taeda	FAC
Pityopsis graminifolia	NL(UPL)
Polygonum hydropiperoides	OBL
Prunus serotina	FACU
Pteridium aquilinum	FACU
Pterocaulon pycnostachyum	FAC
Quercus laurifolia	FACW
Quercus nigra	FAC
Quercus pumila	NL(UPL)
Quercus virginiana	FACU
Rhododendron canescens	FACW
Rhynchosis spp.	NI
Rubus cuneifolius	FACU
Saururus cernuus	OBL
Serenoa repens	FACU
Smilax auriculata	FACU
Smilax bona-nox	FAC
Smilax glauca	FAC
Smilax laurifolia	FACW
Sorghastrum secundum	FACU
Sphagnum spp.	NI
Spiranthes tortilis	FACU
Stillingia sylvatica	NL(UPL)
Taxodium distichum and *ascendens*	OBL
Toxicodendron radicans	FAC
Tragia urens	NL(UPL)
Utricularia sp.	OBL
Vaccinium/Gaylussacia spp. includes *V. stamineum*, *V. darowii*, *G. tomentosa*, *G. dumosa*, and *G. frondosa* var. *nana*	NI
Vaccinium corymbosum	FACW
Vaccinium darowii	FACU
Vaccinium elliottii	FAC
Vaccinium myrsinites	FACU
Vaccinium stamineum	FACU
Vitis rotundifolia	FAC
Woodwardia virginica	OBL

Appendix E. *Continued.*

Species	Wetland indicator status	Species	Wetland indicator status
Lyonia ferruginea	FAC	*Xyris* sp.	NI
Lyonia fruticosa	FAC	*Xyris caroliniana*	FACW
Lyonia lucida	FACW		

[a]FAC = facultative.
[b]FACW = facultative wetland.
[c]FACU = facultative upland.
[d]NL = not listed, generally assumed to be upland (UPL).
[e]OBL = obligate hydrophyte.
[f]NI = not included in weighted average analyses.

Best, G. Ronnie, Debra S. Segal, and Charlotte Wolfe. 1990. **Soil–Vegetation Correlations in Selected Wetlands and Uplands of North-central Florida.** U.S. Fish Wildl. Serv., *Biol. Rep.* 90(9). 48 pp.

Vegetation on four hydric and two nonhydric soil series in north-central Florida was sampled as part of a national study examining the correspondence between wetland vegetation and soils. Weighted average calculations produced an ordering of plant communities in general agreement with the hydric character of the soils.

Key words: Wetland, hydric soil, wetland delineation, wetland plants, hydrophytic vegetation.

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U.S. GOVERNMENT PRINTING OFFICE: 1990-773-216/20024

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